JUL 24 1922

Vol. XI, No. 7 JULY, 1922

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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Published Monthly by the American Pharmaceutical Association: Office of Publication, 211 Church St., Easton, Pa. Editorial Office, 253 Bourse Building, Philadelphia, Pa. Annual Subscription, $4 00; Single Numbers, 35 Cents.

THE SEVENTIETH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN CLEVELAND, OHIO, DURING THE WEEK OF AUGUST 14, 1922.

The 1922 meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in Cleveland during Convention Week

Entered as Second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 10,1918.

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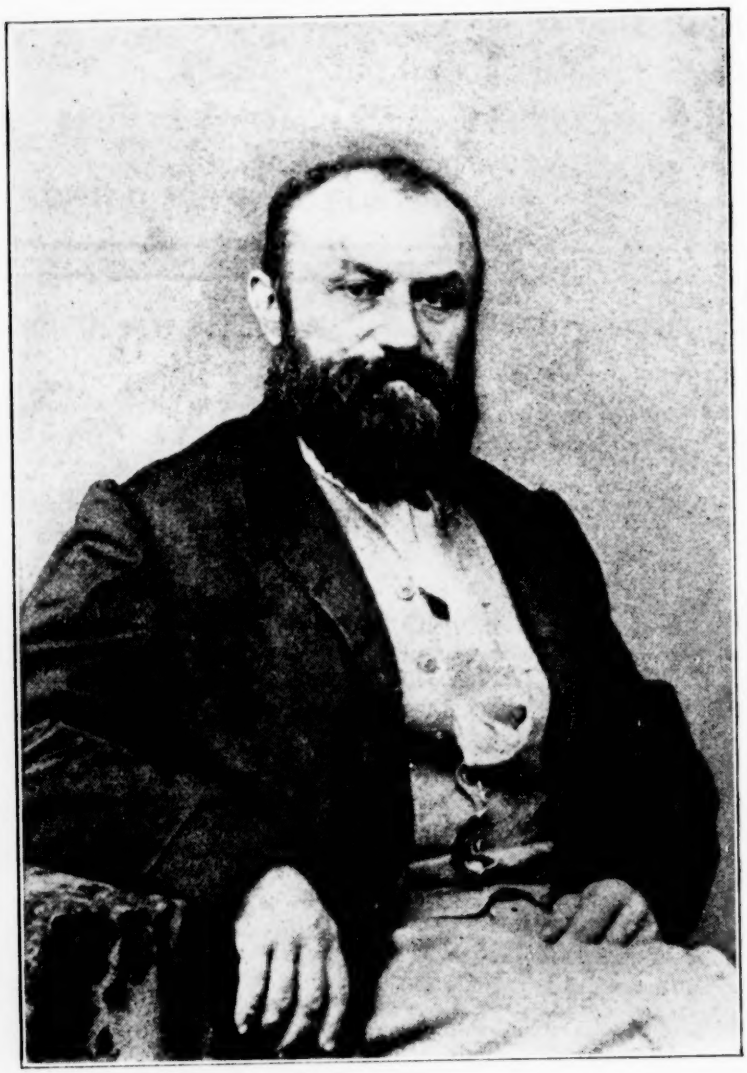
ENNO SANDER

1822-1912

Presided at the Cleveland Meeting of the American Pharmaceutical Association in 1872



Yours faithfully

Enno Sander

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XI JULY, 1922 No. 7

ENNO SANDER.

The presiding officer at the 1872 Cleveland meeting of the American Pharmaceutical Association was Dr. Enno Sander of St. Louis. The photograph* reproduced for the frontispiece of this issue of the JOURNAL was taken about the time of the Cleveland meeting, when President Sander was 50 years of age. He was born at Anhalt, Germany, February 26, 1822, so this is the centenary year of his birth; 75 years ago he graduated at the University of Halle; it is now 50 years since he was president of the American Pharmaceutical Association; 25 years later he received the golden diploma from his Alma Mater, and 10 years ago he concluded his activities among us, 15 days prior to his 90th birthday.

Enno Sander was a member of the Anhalt Chamber of Deputies at the time when Herman Raster, the afterwards famous Chicago editor, was official Reporter of the Chamber. In 1849 he was Assistant Secretary of War in Baden and was taken prisoner, receiving a prison sentence for his connection with the Baden Revolution, but was pardoned in 1850 and exiled, coming to the United States.

In 1853 he opened a drug store in St. Louis, in 1854 a second and in 1865 a third drug store. In the latter year he opened an analytical laboratory, which he continued until 1894.

He was one of the founders of the St. Louis College of Pharmacy and, for a time, professor of materia medica and botany. The late Dr. Otto A. Wall said that the credit of introducing modern pharmacognosy in the United States belongs to Professors Maisch and Sander. Dr. Sander was interested in the study and analysis of mineral waters, and a number of his papers presented to the American Pharmaceutical Association related to this subject (see Volumes 36 and 37, PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION).

In his 80th year he erected a mineral water factory with all the latest improvements, and an aerated water still of his own design. This undertaking proved suc-

* A more recent picture will be found in Volume I, JOURNAL A. PH. A., March 1912, p. 268. For the signature cut we are indebted to Dr. H. M. Whelpley, whose efforts and friendship contributed largely toward making the celebration of Dr. Sander's 80th birthday a pharmaceutical event and success.

cessful in every way. He was of an inventive turn of mind, and received a patent for a medicine chest (1868), a chemical fire extinguisher (1869), and an aerated water still (1904).

Dr. Sander became a member of the American Pharmaceutical Association in 1858, one of the first residents of Missouri to join the Association, and the first Missourian to be elected president (1871). His further activities are indicated by various affiliations. He was a member of the St. Louis Academy of Science, secretary for a time, and its treasurer for 46 years; a member of the Historical and Chemical Societies of St. Louis; the American Medical Association; the American Association for the Advancement of Science; the Association of Military Surgeons; the American Academy of Political and Social Science; the Merchants' Exchange of St. Louis; an honorary member of the Alumni Association of the Maryland College of Pharmacy, and of the Alumni Association of the St. Louis College of Pharmacy.

On his eightieth birthday, twenty years ago on February 26th, Dr. Sander was tendered a banquet in St. Louis by his many friends, and the occasion was a most memorable one; many paid tribute to the work and worth of this man, whose wit and modesty prompted him to say of himself that "he was an eighty-year-old bachelor without a relative in the whole country."

Prof. Joseph P. Remington said of Enno Sander: "He was well read. He had a strong liking for scientific pursuits, a mind capable of grasping facts and a heart swelling with love for his friends. His industry was remarkable."

After the demise of his preceptor, Dr. Otto A. Wall said: "For many years now I have been the sole survivor of all who worked for Dr. Sander when he was in the drug business, and the years as they rolled on simply intensified my admiration and respect for his knowledge of pharmacy and pharmacognosy, and for his rare conscientiousness in training his apprentices, and in conducting the drug business along strictly ethical and professional lines. He was truly a grand old man in pharmacy."

E. G. E.

A PROFESSION DEFINED.

A profession may be defined most simply as a trade which is organized, incompletely, no doubt, but genuinely for the performance of function. It is not simply a collection of individuals who get a living for themselves by the same kind of work. Nor is it merely a group which is organized exclusively for the economic protection of its members, though that is normally among its purposes. It is a body of men who carry on their work in accordance with rules designed to enforce certain standards both for the better protection of its members and for the better service of the public. The standards which it maintains may be high or low; all professions have some rules which protect the interests of the community and others which are an imposition on it. Its essence is that it assumes certain responsibilities for the competence of its members or the quality of its wares, and that it deliberately prohibits certain kinds of conduct on the ground that, though they may be profitable to the individual, they are calculated to bring into disrepute the organization to which he belongs. While some of its rules are trade union regulations designed primarily to prevent the economic standards of the profession being lowered by unscrupulous competition, others have as their main object to secure that no member of the profession shall have any but a purely professional interest in his work, by excluding the incentive of speculative profit.

From "The Acquisitive Society," by R. H. Tawney, Fellow of Balliol College, Oxford.

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

THE ETHICS OF THE PROFESSIONS AND OF BUSINESS.

THE May number of the *Annals* of the American Academy of Political and Social Science is devoted to the expression and betterment of the standards of business and professional conduct that guide men and women when engaged in making a living. The basic element of ethics is justice, hence the term has very extended application, as comprehensive as modern social, professional and business interdependence. Even if considered from a selfish standpoint the wisest thing to do for the individual is to "live the life" which coincides with his highest ideals of right, and to act accordingly in his relations with others. We quote the *Annals* in substance by saying, "To assure reliance and to state ideals the codes of ethics of professions and the newer ethical codes of business become of great public importance." Social progress, industrial expansion, and professional advance are limited by the standards of life and action.

The publication referred to has given about 300 pages to the subject under the editorial direction of Clyde L. King, and among the codes of ethics printed in part are those of the American Pharmaceutical Association and also "Principles of Pharmaceutical Ethics" as proposed at the last meeting of the Association by Ex-President Charles H. LaWall. The report of the Committee on the foregoing has been assigned a place on the program at the Cleveland meeting.

We take the liberty of reprinting the first two paragraphs of the editor's foreword and also the concluding paragraph which may have value for directing thought in shaping our revised code of ethics.

"Codes of ethics are important agencies for social control. The complexities and the specializations of modern industrial life leave many individuals unable to judge whether or not a member of any profession has performed his services with due regard to the interests of all, as well as with due regard to the interests of his client. In all but the crassest and most obvious defaults in service standards the work of the physician must be judged by physicians (*that of pharmacists by pharmacists*)* and that of the lawyer, by lawyers. And so with each of the professions. The higher the skill, the greater the need for organized group effort toward maintaining a fine sense of obligations, not primarily to others in the same profession, but chiefly to the general well-being of all.

"Hence it is that the ideal of all the professions is public service and not monetary gain. The very opportunities for anti-social conduct call forth organized effort to taboo unprofessional conduct. The constructive aim of each of the professions must therefore be the public good. The member of each of the professions has as his means of livelihood the heritage of the ages in his science. His earning power and his opportunity for immortality of influence depend upon the careful work of countless predecessors. The training necessary to a mastery of

* Italics ours.—EDITOR.

a profession gives the opportunity, but not the reason, for enforcing high standards of conduct throughout the profession.

"Codes of ethics are the means by which groups keep their members socially victorious over self-aggrandizement. To survive, such codes must achieve a unity not of negation but of spirit—a spirit that consecrates life to the long-time interests of all through one's efforts while making a living."

A code of ethics questions the actions of an individual as to whether he is really living a life that justifies him in commending himself to himself, to his neighbor, to his profession, or business, to his association. Unless the ancient self-seeking by individuals is to become, under the modern necessity for organization, mere self-seeking by groups, the good of all should be kept clearly in mind, at all times, in framing and observing a code of ethics. E. G. E.

THE PROBLEM OF CONSOLIDATION OF BOARDS.

IN adapting and adopting a quotation of the first editorial we stated, parenthetically, that in all but the crassest and most obvious defaults in service standards the work of the pharmacist must be judged by pharmacists. "And so with each of the professions. The higher the skill, the greater the need for organized group effort toward maintaining a fine sense of obligations, not primarily to others in the same profession, but chiefly to the general well-being of all."

Secretary H. C. Christensen, of the National Association of Boards of Pharmacy, strikes the key-notes in his contention that the members of a profession feel a greater responsibility for the condition of that profession, at any and all times, than others not directly concerned in it. And, in taking away such responsibility by legislation from a profession, the standing of that profession is affected adversely. The members of the profession lose interest, and the public will not receive the protection to which it is entitled. "The Consolidation of Examining Boards" was Mr. Christensen's topic before California State Pharmaceutical Association, and how it worked in Illinois was told by him in the May JOURNAL A. PH. A., p. 376.

As far as Secretary Christensen is informed the administration of the law under the consolidation of boards' plan is placed in the hands of a non-professional. But that makes little difference, the principle is wrong, it is not in accord with professional ethics. If the appointee is not a professional man, he has not the viewpoint of the professions; if he is, he belongs either to one or the other of the professions, and his leanings are to that one, at least he receives such credit, and this eventually produces dissatisfaction. To give the public best service the members of examining boards of the respective professions must be qualified practitioners, who are representative, responsible not only to the state but to the profession of which they are part.

The work of the pharmacist must be judged by pharmacists, thereby the obligations of pharmacy are more closely observed for the general well-being of all.

E. G. E.

EXPENSIVE PRE-JUDGMENTS.

AN informative communication relative to a case in court and a decision rendered in favor of defendants begins with the following questioning statements:

"How rarely right are our preconceived judgments or opinions. How often we jump to adverse conclusions without just cause and from failure to consider all available facts and, in our leaning to one side of the question or toward one course of action, how easily influenced by considerations which have no direct or essential bearing."

Everyone will admit the truth of these observations. The letter is without harsh comments, and the plaintiff is given sympathetic consideration, notwithstanding that a large expense was incurred by the defense. No matter how much money might have been saved by settling out of court, a defense was deemed mandatory for reasons that here require no explanation.

The purpose in mind, at this time, is not to enlarge on the case in question, but to emphasize the necessity for a code of interprofessional ethics, or even an extraprofessional code. The possible consequences of any false step or unguarded utterance cannot be predetermined; this applies to the acts of an individual, a profession, a business, and an association, and one to the other. Physicians realize what reflections on character mean; the reputation of pharmacy and pharmacists is frequently at stake, and because the press is not always careful in the censorship of news items concerning them. These statements could be extended but they are intended to be general and illustrative of a wider application. Many charges are the result of unguarded remarks, impressions of the individual and sometimes, if not often, selfish motives. When a case is disproved and charges unfounded it is unfortunate, because even then public confidence is shaken. From the latter viewpoint, results are worse if the case is proved. The following is abstracted from the communication referred to:

"Every physician knows, and every patient should be given to understand, that in any course of treatment there are, or may be, literally scores of unknown or uncontrollable factors which might affect the outcome. The attendant risks must be boldly faced. When unfortunate results do follow a course of treatment or the use of a product, it is patently foolish for the injured party to fly at the throat of the physician, or for the physician to attempt to shift the entire blame onto the product before obtaining and studying all facts bearing on the case. The resulting expenditure of time, energy and money is extremely wasteful and without benefit to any of the parties concerned. A full and frank review of all the facts of the case should be sought, with all three parties concerned coöperating. But such coöperation can only be had when it is made clear that a review of the facts is to be used only in arriving at an honest, fair and mutually satisfactory adjustment. This is not possible where one or two of the three parties assume a blameless position and force the third into a defensive position."

The good of all should be kept clearly in mind, at all times, in framing, observing and applying a code of ethics. E. G. E.

THE APPLICATION OF CERTAIN PHYSICO-CHEMICAL PRINCIPLES TO THE PRODUCTION OF STERILE PHARMACEUTICAL SOLUTIONS.

BY PETER MASUCCI.

The new science of chemo-therapy had its origin and its greatest stimulus in the epoch-making researches of the distinguished chemist and biologist, Paul Ehrlich. The world owes to this genius its conception of the principles of biochemical affinities, as well as the development of one of the most remarkable synthetic compounds known to man—salvarsan or arsphenamine. This development was based on well-established chemical laws: the laws of mass action, concentration, molecular constitution and pharmacodynamic effects.

Since the publication of Ehrlich's researches, investigators have devoted their attention more and more to the application of physico-chemical laws to the study of the living organism. The great strides made in colloid research and its application to biology is a typical illustration. More recently the determination of hydrogen-ion concentration of solutions and its influence on biochemical compounds has occupied the time of many research workers.

In the preparation of sterile pharmaceutical solutions intended for subcutaneous or intravenous use, the same physico-chemical factors must be considered, in order to obtain solutions that are therapeutically active, safe to administer, the least irritant and the most stable in market containers.

The importance of testing the various salts for identity, purity, and strength is unquestioned but that is not sufficient. Other factors must be given serious consideration, especially with solutions that are to be injected directly into the blood stream. This so-called intravenous therapy is gradually acquiring many adherents, and in some cases has proved far more efficacious than the more familiar subcutaneous method.

Among the more important factors entering into the preparation of sterile pharmaceutical solutions intended for subcutaneous or intravenous use are (*a*) the concentration which causes the least reaction or irritation locally or systemically, (*b*) the hydrogen-ion concentration and means of buffering the solution, and (*c*) the methods of sterilization by heat and what degree of heat, or by candle-filtration. The importance of each of these factors will be elaborated upon and examples given to illustrate the various points.

CONCENTRATION.

While the proper dosage of drugs has been well determined in the vast majority of cases, little attention has been paid to the proper concentration for injection. It must be borne in mind that when a solution of a drug is administered subcutaneously or intravenously, a chemical action takes place between the drug and certain cells of the body. This reaction obeys the laws of chemical dynamics in exactly the same manner that two chemically active substances do when mixed in a test-tube. To illustrate better, C. N. Myers,[1] speaking of arsphenamine, states as follows:

"..... The cause of all chemical reactions is to be found in the fundamental laws of energy changes. Every energy change can be factored into two parts, an intensity factor and a capacity factor. These last two factors are causes of disturbance in the administration of arsphenamine. It is well known that, when two substances are brought together, there is a tendency to equalize

the difference in the intensity of the intrinsic energy producing the chemical change and on this basis the technique of administration must be carried out with the utmost care. A more homely illustration might be used in which a piece of sodium hydroxide is dropped in concentrated sulphuric acid with a violent reaction, whereas if dilute solutions of the same reagents are used, no perceptible change is noted, even though the equilibrium point is the same."

The same laws apply to the subcutaneous and intravenous administration of most drugs. Concentrated solutions are apt to produce local or systemic reactions. The injection of more dilute solutions even though the ultimate dose is the same allows a more gradual reaction.

Concentrated solutions may also be hypertonic which condition is sometimes responsible for local irritation.

Of course, for solutions intended for intravenous use, the right concentration is vastly more important. They are generally *more dilute* than solutions used subcutaneously. As an example we might quote an article by K. F. Maxcy[2] entitled "Limitations to the Use of Quinine Intravenously in the Treatment of Malaria," in which he says in part:

"All the precautions which are observed in giving a dose of salvarsan should be observed in giving quinine. A sterile filtered solution of the quinine salt (dihydrochloride is generally recommended) should be prepared and diluted so that 1 cc contains not more than $^1/_2$ grain of the drug."

In the administration of arsphenamine experience has shown that the proper concentration goes a great way in eliminating severe reactions. This drug is generally given in a dilution of 1 to 20 or 25 cc of distilled water, and it has been found that in this form the formation of precipitates with the proteins of the blood is almost eliminated.

Whenever possible all solutions injected subcutaneously and more so those given intravenously, should be isotonic. This can be readily done by determining the tonicity by cryoscopic or freezing-point method. The freezing point of normal human blood is $-0.526°$ C., therefore solutions with a lower freezing point are hypertonic and those with a higher freezing point than $-0.526°$ C. are hypotonic with respect to human blood. In cases where a hypertonic solution must be used to reduce volume, then that concentration should be used which clinical tests have shown to be least irritating or causes the least reaction when injected subcutaneously or intravenously.

HYDROGEN-ION CONCENTRATION AND BUFFERS.

The rôle of hydrogen-ion concentration and its influence on all biochemical substances has been brilliantly demonstrated by the work of Sörensen, Michaelis, Clark and Lubs, and others. Living cells, especially, are closely controlled in their functioning processes by a limited hydrogen-ion concentration. The application of the principles of hydrogen-ion concentration to the science of bacteriology within the past half dozen years has opened a new line of approach to the complex problem of bacterial metabolism. It has clarified many problems relating to the culture media, the action of acids and alkalis on colloidal hydration, and the effect of buffers on bacterial growth.

Clark and Lubs, in their splendid book on the subject, state as follows:

"Hydrogen-ion concentration influences the condition in solution of every substance with acidic or basic properties—native proteins and their hydrolytic products, amines and amides,

carboxyl, sulphonic, and phenolic compounds. It has a large effect on the effective solubilities and dispersion of colloids, upon determining tautomeric equilibria, and in one way or another in governing the activity of catalysts such as hydrolytic enzymes and oxidases. One or the other of these effects, induced directly or perhaps indirectly by the hydrogen-ion concentration, must impress bacterial life."

The hydrogen-ion concentration of sterile pharmaceutical solutions has received little or no attention. The few isolated cases which have appeared in literature on the subject seem to indicate that this factor can no longer be ignored or neglected. It is safe to state that the time is soon coming when the reaction of sterile pharmaceutical solutions will be determined in terms of hydrogen-ion concentration by colorimetric means or by the more accurate electrometric method, and that its influence on these solutions will be as marked as that in bacteriology.

Before discussing the importance of hydrogen-ion concentration on pharmaceutical solutions, it might be of advantage to explain very briefly acidity and alkalinity in terms of hydrogen-ion concentration, the meaning of buffers, and the rôle they play in maintaining the proper equilibrium in which hydrogen-ion concentration is concerned.

According to the dissociation theory of Arrhenius, when an acid of the hydrochloric acid type is dissolved in water, the acid splits or dissociates almost completely into positive hydrogen and negative chlorine ions. The acid properties of the acid and for that matter of all solutions are due to the hydrogen ions they contain. Some acids such as hydrochloric which are largely dissociated produce a high concentration of hydrogen ions and are classed as strong acids. Acids of the acetic acid type are only slightly dissociated, produce a low hydrogen-ion concentration, and are classed as weak acids. The strength of an acid, therefore, depends absolutely on the number of hydrogen ions present in a certain volume of a solution, that is, on the hydrogen-ion concentration and not on the amount of acid present. At this point it is necessary to emphasize the distinction between titratable acidity and hydrogen-ion concentration. The amount or quantity of acid present is determined by ordinary titrations whereas the degree or intensity of acidity is found by a hydrogen-ion determination made colorimetrically by means of indicators or electrometrically by using hydrogen and calomel electrodes properly connected to some form of a potentiometer. Similarly bases depend for their alkaline properties on the presence of hydroxyl ions, and the strength of a base is proportional to the number of hydroxyl ions present in its solutions. In other words the titrimetric method tells us the total quantity of acid hydrogen available in a given solution but does not tell us what fraction of the total acid hydrogen atoms present are dissociated into hydrogen ions, so that in one case we get the quantity factor and in another case the intensity factor of acidity.

Hydrogen-ion concentration is not expressed in terms of normality but by a symbol known as p_H or potential hydrogen and is equal to the logarithm of the reciprocal of the hydrogen-ion concentration or mathematically expressed $p_H = \log 1/[H^+]$. The p_H of pure conductivity water is 7. This is taken as the point of true neutrality, so that solutions having a p_H value above 7 are alkaline and those below 7 are acid.

The reaction expressed in p_H of a few well-known substances is as follows:

Tenth-normal hydrochloric acid	1
Gastric juice	0.9–1.6
Milk (cow)	6.6–6.8
Blood	7.4
Small intestinal contents	8.3
Tenth-normal ammonium hydroxide	11.0

Closely related to hydrogen-ion concentration is a class of substances called buffers. If 1 cc. of 0.01 N hydrochloric acid is added to one liter of distilled water p_H 7.0 the resulting solution would be about p_H 5.0. If, on the other hand, the same amount of acid is added to a solution of sodium phosphate or to a 1% peptone solution of p_H 7.0, the change of p_H is hardly noticeable. This is called buffer action. By buffer action then is meant the ability of a solution to resist change in p_H through the addition or loss of acid or alkali. Clark[3] has compared the determination of hydrogen-ion concentration to a thermometer and the action of buffer salts to a thermostat.

Salts of weak acids such as phosphates, carbonates, citrates, acetates, borates, etc., exert strong buffer action. Albumins, peptones, amino acids, and proteins in general are also good buffers. The hydrogen-ion concentration of the blood is regulated with remarkable efficiency by means of buffers, such as bicarbonates, phosphates, and proteins. Were it not for the presence of these buffers the slightest amount of acid or alkali injected into the blood stream would increase the acidity or alkalinity to such an extent as to produce symptoms of acidosis or alkalosis.

It is obvious, therefore, that the hydrogen-ion concentration and means of controlling it by buffers enter into consideration in all biochemical reactions. In the preparation of pharmaceutical solutions intended for subcutaneous or intravenous use one must bear constantly in mind the principles just discussed. Wherever possible, the solutions should be adjusted by means of buffer salts to the same reaction or p_H of the blood. This method produces solutions that are least irritating and more stable. In many cases the drug in solution undergoes hydrolysis or decomposition on sterilizing by heat or on standing a long time in the market containers. The result is a product that is physiologically or therapeutically inert. This hydrolysis can be prevented or retarded by controlling the hydrogen-ion concentration with buffer salts. A few examples will illustrate the point more clearly. Levy and Cullen[4] studied the relation of hydrogen-ion concentration to the deterioration of crystalline strophanthin in aqueous solution. They summarize their results thus "Many of the glass containers commonly used in the laboratory, and most of the glass ampules employed in marketing sterile solutions for hypodermic or intravenous medication, yield sufficient alkali on autoclaving to change the reaction of distilled water from p_H 6.0 to p_H 9.0.

"This increase in alkalinity is sufficient to render biologically inert and partially to decompose aqueous solutions of crystalline strophanthin in the concentration ordinarily employed in the clinic.

"It is suggested that for clinical use crystalline strophanthin be dissolved in 0.02 M standard phosphate solution at p_H 7.0 and marketed in hard glass ampuls, thereby insuring stability of reaction with preservation of biologic activity.

"It should be borne in mind both by laboratory worker and pharmacist that the alkali yielded, on heating, by soft glass containers may be responsible for a considerable alteration in the hydrogen-ion concentration of their contents."

Macht and Shohl[5] found that the stability of benzyl alcohol solutions is effected by slight amounts of alkali. They state "Various specimens of benzyl alcohol solutions were sealed in ampules made of different kinds of glass, and such solutions were examined at intervals of time in regard to their anesthetic efficiency on the one hand, and their hydrogen-ion concentration on the other.

"Solutions of benzyl alcohol kept in non-soluble glass preserve their anesthetic properties completely for long periods of time and such solutions tend to increase their hydrogen-ion concentration very slowly.

"Benzyl alcohol solutions kept in soft glass or alkaline containers tend to become alkaline in reaction and rapidly deteriorate in their anesthetic efficiency.

"It is suggested that the best method of preserving benzyl alcohol solutions is to prepare such solutions from a benzyl alcohol free from benzaldehyde and to seal the same after the addition of a buffer solution in hard glass ampules."

Rippel[6] found that solutions of certain alkaloids such as cocaine and its derivatives undergo hydrolysis in an alkaline medium resulting in the loss of activity.

While searching for the cause of the spontaneous deterioration of certain indicators, Mellon, Slagle, and Acree[7] were led to study the purity as measured by their p_H values. These observations revealed a high acid point for some of these dyes, particularly phenolsulphonphthalein, which is so extensively used in kidney efficiency tests. To quote the authors: "As we had been told previously by Dr. Williams of the apparent toxicity of certain batches of phenolsulphonphthalein in the marketed product, it occurred to us that there might be a correlation between p_H and the toxicity." They suggest methods for buffering solutions of phenolsulphonphthalein to prevent increase in toxicity in market containers.

Williams and Swett[8] have made a study of the hydrogen-ion concentration on distilled water, physiological sodium chloride, glucose, and other solutions used for intravenous medication. They bring out the fact that hydrogen-ion concentration of drugs and chemicals used for therapeutic purposes has never been given proper consideration. Clinicians have reported that the intravenous injection of glucose, physiologic sodium chloride, phenolsulphonphthalein, and other solutions is followed by reactions which seem to indicate that they are due to improper hydrogen-ion concentration. They also bring out the fact that in subcutaneous injections hydrogen-ion concentration is also of importance. An abnormal p_H may produce a localized temporary acidosis or alkalosis and that this may explain local reactions evidenced as "sore arms" commonly seen in hospital wards following hypodermic medication. They quote the results on the hydrogen-ion concentration of distilled water, glucose, and physiologic sodium chloride.

Many other instances could be given of the influence of hydrogen-ion concentration and the value of buffering solutions. The reader, however, is probably sufficiently impressed with the examples quoted to know that hydrogen-ion concentration does not only effect the vitality of living cells but also the stability and therapeutic efficiency of pharmaceutical solutions in market containers.

The application of these physico-chemical principles to the preparation of iron cacodylate, phenolsulphonphthalein, glucose and other solutions in the laboratory with which the writer is connected have given very encouraging results.

STERILIZATION.

Sterilization may be accomplished by heat or by filtration through diatomaceous or other suitable filters. Sterilization by heat may be brought about in several different ways—namely, by autoclaving under steam pressure, by heating at 100° C. or by fractional sterilization for three or four days at 50° to 60° C. The choice of method depends entirely upon the substances to be sterilized. Materials, such as caffeine, sodium cacodylate, pituitary extract, physiological salt, etc., which do not decompose at high temperatures may be sterilized in the autoclave for one hour at 115° C. In the case of solutions of substances which undergo decomposition at this temperature (adrenalin, atropine, morphine, cocaine, sparteine, etc.) sterilization may be accomplished by heating at 100° C. or by filtration. Substances which decompose at 100° C. (heroin, strophanthin, calcium glycerophosphate, etc.) may be either sterilized by intermittent sterilization or by candle-filtration. Some substances such as scopolamine, hyoscyamine, and organotherapeutic preparations can be sterilized with safety only by candle-filtration.

It is obvious that the method of sterilization is an important factor upon which depends the therapeutic value and stability of the preparations in the market containers. The greatest care must be exercised in the selection of the right method of sterilization.

To do efficient sterilization work a laboratory must be completely equipped with autoclaves and Arnold sterilizers controlled by thermostats and self-recording thermometers. Each individual filter-candle should be carefully tested for leaks before using.

Moreover, experience has shown that regardless of the method used in sterilization, one cannot take it for granted that the material is sterile without confirming it by cultural tests. A certain percentage of the market containers should be tested for sterility according to the method prescribed by the U. S. Hygienic Laboratory, thus leaving no doubt as to the sterility of the final product.

A word might be said about the selection of ampuls. Only insoluble glass should be used and each lot of ampules should be tested for solubility, thus insuring ampuls that will not give off alkali or glass spicules on long standing.

TOXICITY TESTS.

Experience has shown that ordinary chemical analysis does not reveal the presence of small amounts of toxic impurities, or of slight differences in the molecular structure of a compound. Two lots of a certain drug may analyze the same but yet differ considerably in toxicity. Therefore, certain drugs, notably organic arsenicals, must be tested biologically on suitable laboratory animals to determine their toxicity. Either white mice or white rats are used for this purpose.

Solutions of drugs that are intended for subcutaneous use are generally tested on white mice. In determining toxicity the U. S. Hygienic Laboratory Method is generally followed in which at least five mice are inoculated subcutaneously on each dose and at least 60% of the mice must survive 48 hours or more. On the other hand, solutions of drugs that are to be injected directly into the blood stream are tested for toxicity on white rats. The test solution is injected into the saphenous vein of the rat by means of a burette or a syringe accurately graduated to 0.01 cc. The U. S. Hygienic Laboratory states that for each toxicity test a series

of not less than five rats shall be used and at least 60% of the animals injected must survive at least 48 hours from the time of the injection. While these rules were applied to the testing of arsphenamine and neo-arsphenamine, the same methods may be used for determining the toxicity of other drugs.

The results obtained on these animal tests may be utilized in formulating the proper dose, concentration, and solvent to be used in preparation intended for human use.

CLINICAL TESTS.

It is sufficient to state, however, that in spite of careful physico-chemical and biological considerations, the real proof of a good, stable, potently therapeutic, comparatively non-irritating and non-toxic pharmaceutical preparation lies in the end results, and these are satisfactory clinical tests. Therefore, the work of a laboratory must be so planned as to coördinate the manufacturing, chemical, biological and clinical facts.

In conclusion, then, sterile pharmaceutical preparations can be elevated to a higher scientific place by the application of known physical and chemical principles to physiological processes.

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ORGANOTHERAPEUTICS FROM THE PHARMACIST'S STANDPOINT.*

BY DAVID KLEIN, PH.D.

The administering of gland desiccations and derivatives is a comparatively new branch of therapeutics. Interest in this field, on the part of physicians, is increasing rapidly, with a resulting increase in the number and brands of products that are being offered to the practitioner and to the pharmacist. Concise information concerning the source and manufacture of the various glandular derivatives is not readily available; yet the intelligent purchasing, handling and dispensing of these products must be based upon such knowledge. It is with the hope of clear-

* An address without notes on the above subject was delivered before the Chicago Branch of the American Pharmaceutical Association, March 10, 1922. This paper follows closely the subject matter of that address, although a portion of it, centering around the gland specimens displayed at that time, must obviously be omitted.

ing up some of the confusion that must exist in your minds, that I venture to address you on this subject.

The terminology in this field is neither standardized nor accurate. The products are variously referred to as endocrines, hormones, autacoids, ductless glands, enzymes. The first term is to be preferred, if we are to have due regard for previously recorded phenomena and their names. For instance, the word "hormone" has definite significance in connection with the mode of action of enzymes, and has been demonstrated in certain cases. It has not been shown that all gland actions are hormonic in character. Our knowledge, in fact, of the active principles of the glands, their formulas and properties is very, very meager.

What is known in this field has been accumulated through clinical observations, and biological experiments; the chemical aspect of the subject has been undeveloped and remains as a highly attractive problem. It was through the correlations of thyroid dysfunction and cretinism, myxedema and goiter, of suprarenal dysfunction and Addison's disease that interest in organotherapeutics was awakened. Later the work of Brown-Sequard on testicular extracts added greater impetus to study in this field, and we may say that modern organotherapy dates from the publication of his papers in 1889. Since then, there has grown up a vast literature, which is being added to at a very rapid rate. It would take us too far afield to discuss in detail all the glands included in the term "endocrines" and their functions. The prominent ones are the pituitary, pineal, thyroid, parathyroid, thymus, suprarenal, ovary, testes, mammary, placenta.

These glands profoundly influence the physical and mental status of the individual. Thus, dwarfism is related to hypofunctioning of the anterior pituitary lobe; giantism, to hyperfunctioning of the same organ. Too little thyroid activity produces as extreme types the cretin, and the myxedematous individual; too much thyroid, the exophthalmic goiter. The posterior pituitary body contains a something which can raise blood pressure, and presumably a something else which contracts involuntary muscle. Advantage is taken of the latter property in the use of pituitary extracts in obstetrics and pernicious constipation. The suprarenal medulla contains a chemical compound having the property of raising the blood pressure by constricting the blood vessels. This substance, epinephrin, is the only case of isolation of the active principle in pure form from any of the endocrines. From one other case, the thyroid, a very iodine-rich substance has been prepared, which Kindall believes is the active component of the thyroid. The sexual organs have other than reproductive properties, which influence the manifestations of those characteristics which are usually associated with either sex. The profound changes resulting from castration are common knowledge.

The above are but a few examples of glandular influence. Time will not permit of further discussion of the functions of the various glands, yet it is upon the clinical evidence thus collected that glandular medication is founded. Such treatment presupposes:

1. That the ailment is due to improper endocrine function.
2. That the malfunctioning can be corrected by giving the proper endocrines.
3. That the active principles in the endocrines of animals are effective for man.

Opinion differs as to the method of administering the gland products. Some hold that, excepting certain glands, such as the thyroid, oral administration is ineffective. Others offering clinical evidence maintain that administration by mouth is valuable and proper. Still others argue for hypodermic administration, either intramuscular or intravenous. The whole question presents one of the lively problems of organotherapeutics. Moreover, we know that the endocrines possess antagonistic and synergistic properties; that the action of one gland may be repressed by another and increased by a third. This has led to a pluriglandular therapy, which has for its basis this hypothesis—the cells of the body are able to pick out of the blood stream those endocrine principles in proper amounts that it needs for normal functioning, and to pass up the rest. This hypothesis has led to many bitter arguments among physicians pro and con. You probably are not so much interested in these discussions as you are in the practical consequences. There are many brands of pluriglandular preparations on the market, under simple and also very complex names. Your problem is how many of these to carry, how to give service to the patient upon the physician's prescription, especially when there is no specification.

Turning then to the practical side of organotherapy, there will be found on the market, the desiccated glands in powdered form, in capsules, in tablets, both plain and coated, and in pluriglandular mixtures. Besides these, there are ampuls of liquid extracts of some of the glands. A little later I shall take up the methods of preparation, but here I wish to emphasize that no matter what the form may be, these glandular derivatives are essentially meat products, dried meat powders, if you please, and must be handled accordingly. Moisture and warmth are conducive to spoilage. Glandular products should be kept in tightly covered containers and in a cool place, away from direct sunlight. Our information is very meager regarding the deterioration with time of glandular powders and tablets. In this case, as in others, where there is a lack of information, our advice is to play safe, not to overstock but to buy more frequently from as fresh sources as possible. The liquid extracts are usually dated, if they deteriorate with time.

Let us now consider raw material and methods of manufacture. They are all important factors in establishing the quality of the finished product, and as such are worthy of careful scrutiny by you. The animals from which the glands are derived are the food animals, *viz.*, cattle and hogs and sheep. Since these are handled in largest units by the meat packing companies, it follows that the biggest proportion of raw glands comes from the big meat-killing centers.

Moreover, since the quality of the finished product can be no better than the raw material, special consideration must be given to the proper handling of the glands as soon as they are removed from the animals, in order that the glands may be maintained in as fresh a state as possible. Transportation difficulties make it desirable to work up the glands close to the source of supply; hence, the advantage in raw material that is enjoyed by the packers.

There are different methods of desiccating the raw glands. One largely used is to grind the material in a meat chopper, spread it thin on trays or pans, and dry in a vacuum dryer at a low temperature. Very little is known regarding the stability of the active principles at temperatures above that of the body; it is good procedure to regulate the driers so that the glands do not attain a temperature

above 98° F. until dry. There is a great divergence among manufacturers on the point of temperature.

Many of the dried glands will powder without defatting, but some of them contain too much fat to grind up successfully. These must be defatted. The matter of the solvent to be used is of prime importance. There is little known about the effect that different solvents have upon the potency of the finished product. At any rate, the amount and composition of the material taken out by the solvent differ markedly. As a general rule, the glands that are not defatted are to be preferred, in the present state of our knowledge. At all events, the desiccated material is ground and sifted to remove fibrous material. The number of pounds of raw material to make one pound of finished powder varies with the different glands. Thus a ratio of 1 : 5 means that five pounds of raw glands were required to make one pound of finished powder. It is exceptional for a gland to dry down in a smaller ratio than 1 : 5, so that any product bearing a smaller ratio is to be regarded as having been diluted. The exceptions are certain U. S. P. products, which must be diluted to conform to the standards.

Some confusion exists with regard to the expression of amount of glands contained in tablet, capsule or ampul. Certain pharmaceutical houses express the amounts of glands present, on the basis of the raw glands used in making the desiccation, while others state the amount of dried glands used. Each system has its advantages. A combination of the two is to be preferred; that is, expression of the amount in terms of dry gland, but with a supplementary statement of the equivalence in raw glands. Thus "Thyroid 2 grain. This tablet contains desiccated thyroid gland equivalent to 10 grains of fresh gland." It might be of some interest to know the number of glands required to make a pound of fresh or dried product. It takes about two hundred pituitary glands to make a pound of fresh glands and about one hundred pounds[1] of raw glands to make one pound of desiccated, defatted posterior lobe. About six hundred cow ovaries are needed to make up one pound of dried gland, and a considerably greater quantity of hog ovaries are required for a pound. At the present time, demands are very close to the available supply of pituitaries and ovaries. With the demand for these products rapidly increasing, it is not easy to foresee how the requirements of the medical profession will be met. Relief can only come ultimately through greater production of animals or through the synthesis of the active principles of the glands; in view of our present state of knowledge of the chemical composition of these substances, immediate relief through synthesis is not to be even thought of.

In closing, I should like to emphasize the source and perishable nature of glandular derivatives, the necessity of keeping them in a cool, dry place, the desirability of frequent renewals of stock to insure fresh preparations, and finally the soundness of raw glands and methods of desiccating as factors that make for quality.

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[1] This amount will vary depending upon the way the glands are trimmed at the abattoirs.

THE LEAD CONTENT OF BUROW'S SOLUTION.*

BY JOSEPH L. MAYER.

Burow's Solution, official in the NATIONAL FORMULARY as Liquor Alumini Acetatis, is prepared by dissolving 150 grams of lead acetate in 500 cc of water, and pouring this in cold solution in a thin stream, with constant stirring, into a cold solution of 85 grams of aluminum sulphate in 500 cc of water. The mixture is then set aside in a cold place (about 10° C.) for 24 hours, stirring it occasionally and, finally, making the filtered liquid measure 1000 cc.

The quantities of lead acetate and aluminum sulphate employed are the result of stoichiometric calculations, the object being to produce a solution containing 5% of aluminum acetate, with practically no lead in the finished preparation.

The directions to employ cold solutions and set the mixture aside at a temperature of about 10° C. have for their object the precipitation of lead sulphate, which is formed as a result of the chemical interaction of the lead acetate and aluminum sulphate employed in the preparation of the solution. This procedure is based upon the solubility of lead sulphate in pure water which, according to Seidel, is 0.035 gram in 1000 cc water at 10° C. ("Solubility of Inorganic and Organic Compounds," 2nd edition, page 363.)

Being interested in the question of how much lead Burow's Solution, made according to the NATIONAL FORMULARY, should contain, and, having consulted various reference books without finding any other information than that there should be a trace only, I conducted the following experiments.

A sample of uneffloresced lead acetate, taken from a cork-stoppered bottle, was assayed by the U. S. P. method; it showed the presence of 87.099% of anhydrous lead acetate, which meets the official requirement—"It contains not less than 85.31 percent nor more than 89.57 percent of anhydrous lead acetate."

A sample of aluminum sulphate, taken from a cork-stoppered bottle, when assayed by the method official in the NATIONAL FORMULARY, showed the presence of 16.458% aluminum oxide; this fully meets the requirement of the N. F.—"The weight of aluminum oxide is not less than 16.1 percent of the weight of aluminum sulphate."

Employing these chemicals, making all weighings on an analytical balance with analytical weights, and the final measurements in a glass-stoppered volumetric flask, 200 cc of Burow's Solution were made in strict accordance with the directions of the N. F. The finished product giving heavy precipitates with all of the commonly employed reagents for lead, thus indicating the presence of more than a trace of the metal, I quantitatively determined the amount by the following methods:

A. Five cc of the solution—acidified with slight excess of nitric acid, heated to boiling and electrolyzed for about 3 hours, 3 volts, 1½ amperes—showed the presence of 0.070 gram of lead as metallic lead per 100 cc.

B. Ten cc of the solution, to which a slight excess of sulphuric acid was added, were evaporated down to white fumes; 75 cc of cold distilled water were cautiously added, and the solution stirred thoroughly, 25 cc of alcohol were then added, and the solution allowed to stand over night. The material was then filtered through asbestos on a Gooch crucible; the precipitate was washed with alcohol until free from acid, the lead sulphate was dissolved in ammonium acetate solution.

* Read before New York State Pharmaceutical Association, 1922.

and the crucible and its contents thoroughly washed. This filtrate and wash water were made slightly acid with acetic acid and heated to boiling; the lead was precipitated by means of boiling 10% potassium chromate solution, slowly added from a pipette, the material being stirred vigorously during the precipitation. After the lead chromate had settled the mixture was filtered, while hot, through asbestos on a Gooch crucible and washed with hot distilled water until the filtrate did not show the slightest tinge of yellow, after which the precipitate was dried at about 150° to constant weight.

This method showed the presence of 0.068 gram of lead as metallic lead per 100 cc.

C. Twenty-five cc of Burow's Solution were diluted to about 300 cc with distilled water, and 5 cc glacial acetic acid added; the mixture was heated to boiling; the lead was precipitated by means of boiling potassium chromate solution and the analysis completed as under B.

The analysis showed the presence of 0.0666 gram of lead as metallic lead per 100 cc. This method requires less time for completing the assay than the above in which the lead is precipitated as sulphate and dissolved in ammonium acetate before adding the potassium chromate, and yields results which are practically identical.

Having determined the quantity of lead present, it occurred to me that it would be a good plan to quantitatively estimate the amount of aluminum present in this same sample of Burow's Solution, before and after the removal of the lead, therefore I made these analyses with results as follows:

D. The original solution, assayed by the method official in the NATIONAL FORMULARY, showed the presence of 0.01326 gram of aluminum as Al_2O_3 per cc.

E. Another portion of the original solution which had been acidified with hydrochloric acid and from which the lead was precipitated by means of H_2S, showed the presence of 0.01298 gram of aluminum as Al_2O_3 per cc.

SUMMARY.

1. Burow's Solution made strictly according to the NATIONAL FORMULARY shows the presence of 0.0682 gram of lead as metallic lead per 100 cc.

2. The results of the three methods submitted for the quantitative determination of lead are as follows:

(*a*) Electrolytic	0.0700	Gm. lead as metallic lead per 100 cc
(*b*) Precipitation as $PbSo_4$, solution in $NH_4C_2H_3O_2$, precipitation with K_2Cro_4	0.0680	Gm. lead as metallic lead per 100 cc
(*c*) Precipitation with K_2Cro_4 in presence of $HC_2H_3O_2$	0.0666	Gm. lead as metallic lead per 100 cc
	0.2046	
Mean,	0.0682	

Method C, which is a simple and rapid one, yields results practically the same as the others, which are more involved and time-consuming. The object of employing the glacial acetic acid in this method, is to keep the aluminum chromate in solution without affecting the insolubility of the lead chromate and, therefore, the lead need not be separated from the aluminum as it is in Method B.

These results confirm what I expected—that while the solubility of lead sulphate at 10° C. is 0.035 gram in 1000 cc of water, it would be very much greater in the presence of the aluminum acetate and acetic acid contained in the Burow's Solution and, therefore, there would be more than a trace of lead, even in a preparation made from uneffloresced lead acetate.

3. The original solution shows the presence of 0.01326 gram of aluminum as Al_2O_3 per cc.

The original solution, freed from lead by means of H_2S, shows the presence of 0.01296 gram aluminum as Al_2O_3 per cc, thus indicating that the results are practically identical whether the aluminum is determined in the presence or absence of lead.

4. The amount of aluminum as Al_2O_3 found —0.01326 gram per cc in the presence of lead and 0.01298 gram per cc in the solution freed from lead by H_2S—proves that the NATIONAL FORMULARY standard, "each milliliter of solution of aluminum acetate corresponds to not less than 0.01126 Gm. nor more than 0.01376 Gm. of aluminum oxide (Al_2O_3)," is correct.

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THE DETERMINATION OF TOTAL IRON IN PHARMACEUTICAL PREPARATIONS.

BY J. FORBES WILLIAMS.

There are numerous official syrups, elixirs, tinctures and pills which contain iron in various forms. In most of these preparations no assay is given for the iron determination. Besides the official preparations there are hundreds of tonics on the market, the majority of them containing iron in some form. An effort has been made to establish an assay which gives accurate results in preparations of this class, but which can be performed in a reasonable length of time.

A short résumé of the methods tried and in some degree found unsatisfactory, might be given:—Those depending upon the quantitative liberation of I from KI in the presence of HCl, can be used only when the iron is in the ferric state. Those depending upon the precipitation as $Fe(OH)_3$ are not quantitative when sugar or certain organic acids are present. Those by igniting the sample, taking up in acid and precipitating as $Fe(OH)_3$; the residue after ignition, in the cases where sugar and sodium hypophosphite were present, was only dissolved with difficulty in acids. That, by precipitating as the sulphide, dissolving in HCl, oxidizing with HNO_3 and precipitating as $Fe(OH)_3$, igniting and finally weighing as Fe_2O_3, in nearly all determinations gave accurate results, but required about three hours to run, and when manganese was present in considerable quantity, gave high results.

The results in the last-mentioned method having been for the most part satisfactory, some modification whereby it could be used in the presence of manganese and by which the time required would be reduced, was sought.

By dissolving the FeS in dilute H_2SO_4 and titrating with $N/10$ $KMnO_4$, it was found that Mn did not interfere, besides eliminating a drying, ignition and weighing.

An outline of the assay finally decided upon is given.

To 10 cc of the sample in a 125-cc beaker, add 10 cc. H_2O, 5 cc HNO_3, and boil for 5 minutes. Add 5 cc of 10% NH_4Cl solution, then add NH_4OH until neutral or only slightly acid. Cool and run in H_2S for 1 minute; add excess of NH_4OH and continue to pass in H_2S until com-

pletely precipitated. Filter through a small Büchner funnel connected as in Fig. 1 and previously prepared by fitting in a filter paper and overlaying with a thin layer of asbestos filter media. Wash the precipitate with three 15-cc portions of H_2O containing 1% NH_4S and 1% NH_4Cl. Disconnect flask, discard filtrate, rinse flask and reconnect to funnel. Pass five 15-cc portions of hot 10% H_2SO_4 through the funnel, disconnect and boil filtrate until free from H_2S (shown by the vapors not darkening a piece of filter paper moistened with lead acetate solution). Cool and titrate with $N/10$ $KMnO_4$.

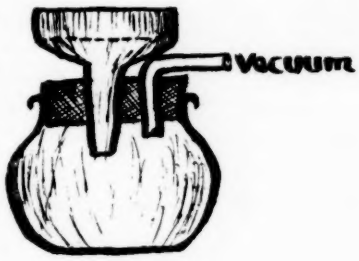

Fig. 1.

A number of preparations were assayed giving results that checked well, but as no other good checking method was available and as the actual iron content was not known, it was thought advisable to repeat the experiments using preparations made by dissolving exact amounts of iron of known purity in the required acids, etc., and then adding the other ingredients.

For the sake of convenience in tabulating and comparing, the iron content in all the liquids was made at one percent instead of the percentage required by formulas.

RESULTS OBTAINED.

	Percent actual.	Percent found.
Solution of Ferric Hypophosphite	1.000	1.005
	1.000	1.005
Elixir Ferric Phosphate	1.000	1.010
	1.000	1.005
Syrup Iron and Manganese Iodide	1.000	1.016
	1.000	1.010
Beef, Iron and Wine	1.000	0.980
	1.000	0.988
Pills of Ferrous Iodide (1 pill)	0.0400 Gm.	0.0405 Gm.
	0.0400 Gm.	0.0410 Gm.

SUMMARY.

An assay has been outlined for the determination of iron in pharmaceutical preparations, which in a number of analyses gave an error not exceeding 0.002 gram.

The time required by the writer, to complete one analysis, was 25 minutes, six analyses having been completed within an hour.

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THE ASSAY OF SALICYLIC ACID AND OFFICIAL SALICYLATES.*

BY ABRAHAM TAUB AND HARRY TAUB.

The present U. S. P. assay of the alkali salts of organic acids having in certain cases proved unsatisfactory, as reported from many authoritative sources, the authors undertook, at the suggestion of Dr. H. V. Arny, Chairman of the Sub-Committee on Inorganic Chemicals, U. S. P. Revision Committee, a study of the

* Read before New York State Pharmaceutical Association meeting, 1922.

relative merits of those methods at present in vogue, with a view of obtaining a method that might be adopted in the next United States Pharmacopoeia. The method, to be suitable for the needs of the U. S. P., should be fairly accurate, rapid and simple. The present investigation was taken up with regard to salicylic acid and salicylates only.

An examination of the bibliography of the subject showed that nearly all of the assay methods fall within the following six groups.

(1) Colorimetric.
(2) Conversion into inorganic sulphates or chlorides by ignition with H_2SO_4 or HCl.
(3) Weighing or titration of liberated organic acid following its extraction with a volatile solvent.
(4) Gravimetric iodine or bromine methods.
(5) Volumetric methods involving iodine.
(6) Volumetric methods involving bromine.

The few miscellaneous assays included one dependent upon the insolubility of crystals of calcium salicylate.[1] However, this does not give strictly quantitative results. Another assay for bismuth salicylate[2] was not investigated, since the present U. S. P. assays this salt for it Bi_2O_3 content.

1. Regarding colorimetric assays[3]—their only value lies in the detection of traces of salicylic acid, as when present as adulterant in foods, aspirin, etc. The presence of free mineral acids, benzoic acid and other substances greatly affects the accuracy of the method.

2. Methods based upon the ignition of salicylate as sulphates or chlorides by treatment with the appropriate acid. Lyons[4] points out that this method is open to the objection that any inorganic impurities present in the original salt will give high results due to their presence in the ash.

3. Assays in which salicylic acid is liberated from its salt, extracted with chloroform and then titrated,[5] although theoretically excellent do not work out satisfactorily when tried out on commercial samples. The presence of benzoic or cinnamic acids or their salts in the original samples is not excluded in this method of assay. Where the liberated salicylic acid is weighed instead of titrated after extraction, the results may be either too high or too low. If a low temperature is used in vaporizing the volatile solvent, some of the latter always remains behind. If too high a temperature is employed a little salicylic acid is lost.

4. Among the gravimetric assays are the following:

The method of W. Autenreith and F. Beuttel[6] depending upon the formation of tribromphenolbromide requires much time. The precipitate of the latter compound is kept on ice for six hours and then dried under reduced pressure before weighing. It does not yield accurate results.

Bougault[7] was the first to utilize iodine in the gravimetric determination of salicylic acid, the resulting product being diiodophenylene oxide, $C_6H_2I_2O$. This

[1] Ewell and Prescott, *Analyst*, 13, 208, 1888.
[2] Kollo, PROC. A. PH. A., 47, 719, 1899.
[3] Muter, *Analyst*, 1, 193, 1877.
[4] JOUR. A. PH. A., 7, 603, 1918.
[5] Ehman, *Ibid.*, 2, 156, 1913.
[6] *Arch. Pharm.*, 248, 112, 1910.
[7] *J. pharm. chim.*, 28, 45, 1908.

method was tried out by the authors and was found to give variable results. However, a recent modification of the above, by W. O. Emery,[1] proved to be satisfactory.

The following 5 assays were carried out by this method:

0.4 Gm. salicylic acid was neutralized with $N/10$ NaOH and made up to 200 cc solution. Weight of precipitate × .4012 = Gm. salicylic acid.

No. of cc of solution.	Gm. salicylic acid.	Weight of precipitate Gm.	Per cent salicylic acid.
25	.05	.1244	99.82
25	.05	.1240	99.50
20	.04	.0993	99.80
20	.04	.0990	99.50
20	.04	.0990	99.50

Since the Emery method is rather lengthy and gives variable results unless strict attention is paid to the many details, as was found out by making slight deviations from the directions, the present authors considered the method unsuitable for the U. S. P., and would fall back upon it only in the event that a simpler method could not be found.

5. Volumetric methods in general are the ideal methods from the standpoint of the Pharmacopoeia and therefore the present authors spent the greater part of their time in investigating these.

Messinger and Vortmann[2] as far as we could find were the first to employ iodine volumetrically in the assay of salicylic acid. This method, with many modifications, was tried out by Seidell[3] and found to give very unsatisfactory results. Experiments conducted by the present authors gave results ranging from 88.5% to 109.2% for a U. S. P. sample of salicylic acid, thereby confirming Seidell's observations. The outstanding flaws of this method are that the amount of NaOH employed can be varied only within narrow limits, which would necessitate having a previous knowledge of the percentage salicylic acid in the sample. Likewise the amount of $N/10$ iodine in excess is an important factor in giving variable results.

Wilkie[4] has submitted a modification of the above iodine method in which he adds the $N/10$ iodine before the NaOH. Seidell, however, finds it unsatisfactory when tried out on thymol.

6. Bromine volumetric methods have their supporters and adversaries. W. Fresenius and L. Grünhut[5] found the original bromate method of Freyer[6] gave fair results. Seidell[7] gets varying results with the same method. Instead he proposes a rather cumbersome method, using bromine vapor and forming dibromosalicylate.

Jones[8] in an article on the assay of sodium salicylate uses Koppeschaar's solution, letting it stand for 15 minutes with the sodium salicylate before titrating.

[1] *J. Ind. Eng. Chem.*, 13, 538, 1921.
[2] *Ber.*, 23, 2753, 1890.
[3] *Jour. Am. Chem. Soc.*, 31, 1168, 1909.
[4] *J. Soc. Chem. Ind.*, 30, 398, 1911.
[5] *Z. anal. Chem.*, 38, 292, 1899.
[6] *Chem.-Ztg.*, 20, 1920, 1896.
[7] *Am. Chem. J.*, 47, 520, 1912.
[8] JOUR. A. PH. A., 9, 878, 1920.

I. M. Kolthoff[1] uses $N/10$ $KBrO_3$ and adds KBr to it before use in determining salicylic acid. He allows the solution to stand 5 to 10 minutes before titrating.

To determine which method gives the best results, the author ran a series of assays based upon the present U. S. P. assay for phenol, varying the amount of sample, excess of bromine, concentration of acid, and length of time of standing before titration.

The following tabulates the results of 16 determinations:

1 Gm. of salicylic acid neutralized with $N/10$ NaOH and made up to 500 cc. (It was found that a slight amount of free NaOH, if present, does not vitiate the results.)

Cc of solution.	Gm. salicylic acid.	Cc $N/10$ Koppeschaar's T. = 1000.	Cc $N/10$ $Na_2S_2O_3$ $5H_2O$ T. = 0.975.	Cc of conc. HCl.	Time min.	Per cent salicylic acid.
30	.06	30	4.8	5	45	97.1
30	.06	30	4.55	5	45	98.2
30	.06	30	4.3	2	30	99.3
30	.06	30	4.4	5	30	98.9
25	.05	30	8.65	5	40	98.8
25	.05	30	8.6	5	30	99.0
25	.05	30	8.5	2	20	99.4
25	.05	30	8.4	2	20	99.8
25	.05	30	8.5	2	20	99.4
25	.05	30	8.5	2	20	99.4
20	.04	25	9.0	3	5	93.3
20	.04	25	8.7	3	10	95.0
20	.04	25	7.9	3	20	99.5
20	.04	25	7.95	3	25	99.3
20	.04	25	7.85	3	35	99.7
20	.04	25	8.3	3	45	97.2

1 cc $N/10$ Koppeschaar's V. S. = 0.002301 Gm. salicylic acid.

From the foregoing the following conclusions can be drawn: The amount of excess of $N/10$ bromine V. S. does not affect the results; 2 to 3 cc of HCl is the best concentration of acid; 5 to 10 minutes' standing is not sufficient, 20 to 30 minutes gives the best results. Longer standing gives poor results. It will be noticed in the above assays, that a difference of 0.1 cc $N/10$ $Na_2S_2O_2$ V. S. gives a variation of about 0.4% of salicylic acid.

In the following determination of salicylic acid and sodium and strontium salicylates, $N/50$ thiosulphate V. S. was employed.

In all the analyses 0.4 Gm. of each chemical was dissolved in 200 cc H_2O. Time of standing—20 minutes; used 3 cc of HCl.

SALICYLIC ACID.

Brand.	Cc of sample.	Gm. sample.	Cc $N/10$ Br. V. S. T. = 1000.	Cc $N/50$ $Na_2S_2O_3$ $5H_2O$ T. = 0.975.	Per cent salicylic acid.
L	25	.05	25	17.7	99.4
L	25	.05	25	17.8	99.3

[1] *Pharm. Weekbl.*, 57, 699, 1921.

Sodium Salicylate.

Brand.	Cc of sample.	Gm. sample.	Cc $N/10$ Br. V. S. T. = 1000.	Cc $N/50$ $Na_2S_2O_3$ $5H_2O$ T. = 0.975.	Per cent sodium salicylate.
L	25	.05	25	32.8	99.2
L	25	.05	25	32.8	99.2
B	25	.05	25	32.6	99.4
B	25	.05	25	32.3	99.7
M	25	.05	25	32.7	99.3
M	25	.05	25	32.6	99.4

Strontium Salicylate.

					Per cent strontium salicylate
L	30	.06	25	36.0	99.3
L	30	.06	25	36.4	99.0
S	30	.06	25	35.8	99.44
S	30	.06	25	35.9	99.36
M	30	.06	25	36.4	99.0
M	30	.06	25	36.2	99.12

1 cc $N/10$ Koppeschaar's Solution V. S. = .002301 Gm. salicylic acid.
1 cc $N/10$ Koppeschaar's Solution V. S. = .003311 Gm. strontium salicylate.
1 cc $N/10$ Koppeschaar's Solution V. S. = .002666 Gm. sodium salicylate.

SUMMARY.

Of all the methods tried, the one we find satisfactory is the following "Bromate" volumetric assay:

About 0.4 Gm. of substance, accurately weighed, is dissolved in H_2O to make 200 cc. Of this solution 25 cc, representing 0.05 Gm. sample, are placed in a 250-cc glass-stoppered flask, preferably one with a long narrow neck. Tenth-normal Br V. S. (25 cc) is added, followed by 3 cc of concentrated hydrochloric acid. Insert the stopper and let stand 20 to 30 minutes with occasional shaking. Remove the stopper, add 5 cc of potassium iodide solution (1.5) and 1 cc chloroform and insert stopper again. Shake until the precipitate is dissolved in the chloroform, remove stopper and rinse it and the neck of the flask with distilled water. Titrate with $N/10$ thiosulphate, V. S., using starch T. S. as indicator.

With strontium salicylate it is preferable to use 30 cc of the solution of the sample, equivalent to 0.06 Gm. of the salt.

COLUMBIA UNIVERSITY COLLEGE OF PHARMACY, JUNE 1922.

CRUDE DRUGS—THEIR SELECTION AND MILLING.*

BY J. L. HOPKINS.

Mankind, from the dawn of his intelligence to the present day, has turned to nature for the means of obtaining relief from his ills. There is hardly a plant that grows that has not somewhere, or somehow, or at sometime, been tried out and sometimes the endeavor to establish its therapeutic worth has resulted in fatalities. To-day botanicals are examined microscopically and by chemical analysis, and human lives are no longer sacrificed in an effort to determine drug values. Some observations along these lines are in keeping at this time.

Every pharmaceutical chemist is aware that the percentage of "active principles" found in botanical drugs varies to such an extent as to render the preparations from many of them of most uncertain value unless the definite amount of active principle is determined by assay. This element of uncertainty attending

* Parts of an address delivered at the annual meeting of the American Pharmaceutical Manufacturers' Association, Bedford Springs, Pa., June 1922.

the use of drugs which are not of uniform medicinal activity, notably aconite, belladonna, colchicum, digitalis, ergot, gelsemium, hyoscyamus, nux vomica, opium, etc., is well understood, and standards are provided to insure preparations of definite and uniform potency. Assayed drugs have proved their value as instruments of definite potency, and by their use the manufacturers of pharmaceuticals can produce finished products which are effective, accurate and elegant, in conformity with the standards of the United States Pharmacopoeia.

Too great care cannot be exercised in discriminating between species of drugs which are offered from the foreign market. The scarcity of certain European plant drugs has led many to accept American specimens of the same species, under the erroneous impression that there is no difference whatever between the remedial power of the foreign and the domestic articles. There is, in the case of a number of plant drugs, a difference between the remedial power of one grown in its natural geographical range and one of the same species grown elsewhere. It does not necessarily follow from the mere fact that the American and the European species yield the same alkaloidal or glucosidal totality and exhibit no morphological dissimilarities that the remedial power of the two are identical; for the remedial power of some plant drugs cannot be measured entirely by their alkaloidal or glucosidal content. A European and an American plant drug may be botanically identical, but therapeutically unlike, and, under these conditions, it is not the part of prudence to substitute the latter for the former in the manufacture of remedial agents. The plant drugs should be, in every instance, true to representation of source.

Crude drugs, to be at their best, must be collected under the most favorable conditions. As a matter of fact, the inferior quality of many drugs is often directly traceable to their being gathered at improper seasons, and even from the wrong part of the plants or trees. For instance, the bark of wild cherry yields far more of the active principle, hydrocyanic acid, when gathered in the autumn, than when gathered in the spring. Wild cherry bark produced in April 0.0478 percent hydrocyanic acid, and from a sample gathered in October 0.1436 percent, or about three times the amount. The specimens of bark assayed were taken from the same tree, and from the same part of the tree. It is therefore highly essential that the various parts of medicinal plants should be gathered at the time we know is most favorable to the attainment of their full therapeutic value.

Speaking in a general way, the roots of annual plants should be dug immediately before the flowering period, and those of biennials and perennials late in the fall or early in the spring. The bark of trees should be gathered in the spring, and of shrubs in the autumn; flowers just before they are perfectly developed, and seeds when fully ripe. A failure on the part of a collector to be guided by these principles is often directly responsible for the variable quality of crude drugs.

Milling is a very vital part of drug manufacturing, and the life of the drug—the active principle—is often destroyed by poor milling. When the drug has proved to be of satisfactory quality it next passes to the millers, whose experience and good judgment must be exercised in order to avoid injury to their medicinal properties. The volatile constituents of drugs are often the active principles, and care is necessary to prevent their loss during the process of drying and milling. Special mills must be used for certain articles, such as poisonous and non-poisonous—those of light color—articles strongly aromatic and pungent—and those com-

paratively free from odor. The fibrous and inert part of drugs must be prevented from entering the medicinal part, and this cannot be successfully accomplished if the capacity of the mill be overtaxed, or if iron mills of high speed be employed. A cause of injury to the drugs during the process of milling is the excessive heat from friction, whereby the volatile constituents of many drugs are driven off and their color and medicinal value are materially impaired. The use of iron mills is prohibited whenever a trace of iron is objectionable.

A most important feature and value in grinding crude drugs is the accuracy of granulation in keeping with the requirements of the United States Pharmacopoeia. In order to obtain a proper granulation for percolation, and to secure the entire medicinal properties from many drugs, it is often necessary to use different mechanical processes; without such care, an irregular granulated powder results, which either clogs up the percolator or allows the menstruum to pass through too freely. Crude drugs should be milled in strict accordance with their nature.

WHAT IS ALOES, U. S. P.?*

BY E. N. GATHERCOAL AND R. E. TERRY.

The U. S. Pharmacopoeia continues to recognize three commercial aloes—the Socotrine Aloes, which from time immemorial has been obtained from the little island of Socotra in the Indian Ocean; Curacao Aloes, obtained from the Dutch West Indies, a few small islands off the coast of South America; and Cape Aloes, indicating several commercial kinds obtained from British South Africa. A very well-known commercial aloes, namely, Barbadoes, similar to Curacao, is now produced in such small quantities that it has been dropped as one of the commercial kinds mentioned in the Pharmacopoeia. Recent importation statistics indicate that the bulk of aloes used in America is from the Dutch West Indies. For instance, in 1919, 1,686,800 lbs. of aloes were imported, of which 1,296,891 came from the Dutch West Indies, 4,767 lbs. from the Barbadoes and 176,132 lbs. from British South Africa. The remainder was imported from other countries, principally England, and included whatever small amount of Socotrine Aloes was received into this country. Furthermore, the range of prices indicates why so much of the aloes is imported from the Dutch West Indies. Thus Curacao is priced in the current wholesale price lists at 20 to 25 cents, Socotrine Aloes is quoted at $1.34 to $1.43 and Cape Aloes is quoted at 32 cents, per pound.

As to the therapeutic value of aloes there is a wide divergence of opinion. While Socotrine has a very long history and enjoyed for many centuries a high repute, modern investigators claim that therapeutically it is of no more value than West Indies Aloes or South African Aloes. In reviewing the literature it becomes evident that each of the commercial kinds of this drug has its strong advocates.

From their physical appearances it becomes frequently very difficult to distinguish between these three kinds of aloes. The drug is prepared by evaporating the juice which is exuded from the large thick leaves cut off from the plant. Sometimes the juice is allowed to ferment before or during the process of evaporation. Sometimes the evaporation is spontaneous in the hot sun, sometimes it is hastened

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*Read before annual meeting Minnesota Pharmaceutical Association and Northwestern Branch, A. Ph. A., February 1922.

by heating over slow fires, and sometimes boiling the juice is practiced. Furthermore, these various processes are applied to all three kinds of aloes. The result is that with each kind of aloes different lots may have widely divergent appearances.

Therefore the point arises as to whether it is really worth while for the Pharmacopoeia to continue the differentiation between the three kinds of Aloes.

Working along this line I have the following suggestions to offer:

First, External Color of the Drug.—The present description in the Pharmacopoeia states that Socotrine Aloes varies from yellowish brown to blackish brown; that Curacao Aloes varies from orange to blackish brown, and Cape Aloes from reddish brown to olive-black. I defy anyone to distinguish between these three ranges of color! One might just as well say that *Aloes* is yellowish brown to nearly black in color. It is true that we do have the "hepatic" form of aloes, which is muddier in color and derives its name from its resemblance to freshly cut liver, but hepatic aloes occurs in all three of the commercial kinds of aloes.

Second, Size and Shape.—Aloes sometimes appears on the market in a semi-fluid condition, frequently in a plastic condition, but most often hard and brittle, the latter forming angular masses of varying size and shape. Socotrine sometimes comes in monkey skin containers, and Curacao occasionally comes in gourds, but the great mass of aloes is imported in boxes or cases holding up to one hundred or more pounds.

Third, Fracture.—There seem to be but slight differences in the appearance of the fracture surfaces of the various aloes. In the hepatic varieties the surface is much less glistening and glassy than in the non-hepatic forms.

Fourth, Odor and Taste.—Socotrine has an odor somewhat different from either Curacao or Cape Aloes. If one warms slightly a fragment of Socotrine Aloes, one can usually detect a rather agreeable aromatic or saffron-like odor, while with Curacao and Cape Aloes the odor is decidedly disagreeable and not aromatic. It is true, however, that Socotrine Aloes, especially when not aged, does not always develop the saffron-like odor but is disagreeable and sour in odor. The taste of all varieties of aloes is very bitter.

Fifth, Color of the Powder.—Mention is made in the present pharmacopoeial description of the color of the powder. Socotrine is described as dark brown, Curacao as deep reddish brown and Cape as greenish yellow. The eleven samples of Curacao Aloes we examined, when reduced to a fairly uniform, moderately fine powder, and viewed in reflected light in even layers on papers, gave a wide variation of color, from a gray-yellow-orange to a dark brown. The two samples of Socotrine Aloes were of a bright yellow-orange and a dark yellow-orange. The four samples of Cape varied from a dark yellow to a dark brown. One cannot distinguish between the three classes of aloes by the color of the powder. The present description also states that the powder when mounted in expressed oil of almond and examined under the microscope shows, in the case of Socotrine Aloes, yellowish to reddish brown irregular or angular fragments; in the case of Curacao Aloes, blackish brown angular fragments; and in the case of Cape Aloes, bright yellow angular fragments. We found that with all varieties of aloes the color of the fragments when so mounted and viewed under the microscope varied from a real light amber-yellow to a dark brownish, according to the thickness and bulk of the fragment, and that it seemed to be impossible to distinguish between the powders by this means.

Sixth, Solubility.—The present Pharmacopoeia states that Socotrine Aloes is soluble to the extent of not less than 50% in cold water; Curacao and Cape Aloes not less than 60%. The result of the examination of two samples of Socotrine Aloes is 40.7% and 58.6% soluble; of eleven samples of West Indies Aloes (Barbadoes and Curacao) is from 49% to 76% soluble, and of five samples of Cape Aloes is from 38.5 to 77.4% soluble. Of the Cape and West Indies Aloes seven samples were less than 60% soluble.

Seventh, Color of the Aqueous Solution.—Mention is made of the color of the aqueous solution in the present pharmacopoeial description, the statement being that Socotrine Aloes yields a solution of yellowish color, Curacao a solution of purplish red color and Cape Aloes a solution of pale yellow color. This statement in the Pharmacopoeia is quite indefinite because no specifications are made as to how the color shall be determined, and, of course, the concentration of the aloes in the liquid and the depth of the liquid make a wide variation of the color. For determining these colors we prepared solutions by shaking for two hours 1 gram of the powdered aloes in 25 cc of water, filtering and making up to 100 cc in a volumetric flask and viewing by transmitted white light through the bulb of the flask. The two samples of Socotrine Aloes gave a dark yellow solution. The solutions of the eleven samples of Curacao varied from a dark yellow-orange to a dark red-orange. Of the four samples of Cape Aloes, two gave solutions that were yellow and two dark yellow. All samples of aloes are almost entirely soluble in alcohol, especially if the alcohol is warm, if they be free from impurities.

Eighth, Color Produced by Nitric Acid.—The Pharmacopoeia mentions that nitric acid added to powdered Socotrine Aloes yields a yellowish to reddish brown solution; added to Curacao Aloes yields a deep red liquid; added to Cape Aloes yields a liquid that is reddish brown in color, changing to purplish brown and finally greenish. These tests were tried out on the eighteen samples and while the color reaction was usually true to the statement, there was much difficulty in distinguishing between the deep red of Curacao and the reddish brown of Socotrine Aloes, and the green color of Cape Aloes was often very poorly developed. Therefore, we tried out the same reaction by mixing the *aqueous solution* mentioned above with nitric acid in the proportion of 5 to 2, and the results were splendid. In each case the eleven samples of West Indies Aloes gave very distinctly a bright red color. The two samples of Socotrine Aloes remain of a bright yellow color which becomes a bright red upon heating. The four samples of Cape Aloes assumed at first a reddish color which soon changed to a more or less brilliant green.

Ninth, Other Tests.—Aloes contains emodin and to conform to the U. S. P. requirements it must show the reddish color formed when emodin is brought into contact with ammonia water. The dilution prescribed is 1–1,000. All samples examined responded to this test.

SUMMARY.

To return to the original question—Is it really worth while for the Pharmacopoeia to continue the differentiation between the three kinds of aloes? From a therapeutic standpoint it would seem not. No physician ever specifies in his prescription a particular kind of aloes or of aloin. So far as I know, no manufacturer recommends the superiority of any particular kind of aloes or aloin, and, undoubtedly, buys for his preparations the West Indies Aloes, which is commercially the

lowest priced. We do not distinguish in dose between the three. Yet, it is true that there is a specified demand from some sources for these various commercial kinds of aloes, and perhaps the Pharmacopoeia as a book of standards should continue the differentiation. While it is doubtful whether we can bring out positive points of distinction in external color or color of the powder, size or shape, odor or taste, microscopic appearances, or solubility in water or alcohol, we do have a very definite distinction in the color of the aqueous solution and in the color produced with nitric acid. Despite all of the work that has been done for many years on aloes, it seems that no really satisfactory assay has as yet been devised for determining the percentage of aloin present. Furthermore, according to the literature, there is a wide variation in the percentage of aloin present in the various kinds of aloes, ranging possibly from 4 to 30%. Also, it is true that the full therapeutic value of aloes is not due entirely to the aloin. It would appear as though an excellent opportunity lies in the study of the therapeutic acitivity of aloes compared with its aloin content.

UNIVERSITY OF ILLINOIS
SCHOOL OF PHARMACY, 1922.

THE PHARMACEUTICAL MANUFACTURER AND PHARMACOPOEIAL REVISION.*

BY F. F. BERG.

The popular conception of the Pharmacopoeia is that of a book to be found on the shelf of every well-regulated pharmacy, which the pharmacist uses as a guide for the practice of his profession. This conception is entirely proper for such is the purpose which its founders and revisers have intended it to fulfill, but in recent years it has found a place with other professions that are likewise governed by its standards.

Referring to the historical introduction of the present Pharmacopoeia it is possible to trace each revision, and how, through the coöperation of medical and pharmaceutical interests, the volume has changed with each succeeding decade to meet more exacting demands.

It is not within the scope or intent of this paper to comment at length upon the tremendous and marvelous advance made by medical science within the past few years, but may it suffice to say that any authoritative work serving to provide, regulate or standardize medicinal matter is subject to revision in accordance with that which medical science finds to possess therapeutic value, or may be needed as a manufacturing adjunct to the same.

From its earliest form, when it constituted the means of establishing uniformity for the commonly used medicaments of the day for the doctor and pharmacist, its scope has been enlarged to include preparations, compounds and component parts thereof, which are so diversified in form, and subject to such specifications for purity, quality and strength, that it has become necessary to include with the doctor and pharmacist in the revision proceedings the combined knowledge and skill of chemists, biologists, pharmacologists, and teachers, which professions

* Read before New York Branch, A. Ph. A., May meeting, 1922.

may in turn represent diversified interests all of which are concerned or affected by the Pharmacopoeia as the standard by which their products are judged or their manufacturing materials purchased.

The trend of the pharmacist during the recent years and purchasing from manufacturers such standardized products as were formerly prepared in the drug store, have created a condition which has affected revision proceedings in so far as the classes of material which are no longer prepared by the retail pharmacist are concerned. In recognition of this fact, those preparations which are now accepted manufactured commodities, though recognized in the Pharmacopoeia, bear no directions for the preparation of same—this being left to the discretion and ingenuity of the individual manufacturer, so long as the finished products meet standards provided for the same.

The extent to which this procedure has progressed may be gained by reference to U. S. P. IX; on the first 100 pages are found 127 monographs covering botanicals, chemicals and preparations which on further inspection reveal that of these 101 are of the kind now prepared and supplied by several manufacturers, whereas 26 may be classed among those which pharmacists prepare. A further examination of the Pharmacopoeia reveals the presence of several classes or groups of preparations which are prepared entirely by pharmaceutical manufacturers—extracts, fluidextracts, oleoresins, alkaloids, inorganic and organic chemicals, glandular and biologic products, etc.

It is not the intent of the writer to condemn pharmacists for neglecting to keep abreast of the times in supplying the newer materia medica products. The nature of the materials used and the equipment necessary for manufacture and standardization do not lend themselves to installation in the pharmacy, nor is it economical for a pharmacist to prepare and standardize many of these products. It is obvious that it is far better to purchase Tincture of Hyoscyamus than to prepare a 1000-cc portion, which requires 250 cc for its assay and another 250 cc to verify the result, nor is it within the province of the pharmacist to standardize those preparations which require biological technique.

The extent to which pharmaceutical manufacturers are interested in pharmacopoeial revision proceedings may be judged from the foregoing.

By pharmacopoeial revision older forms of medication are either improved or deleted and new therapeutic agents are added to the Pharmacopoeia. Experience gained during each intervening decade in medicine, chemistry, pharmacy and allied sciences largely shapes and directs the work of revision. Through organization, the above-named professions within the individual manufacturing concerns are able to lend assistance to revision proceedings by contributing their combined knowledge to the solution of problems which must be solved, and by submitting accumulated data, which is an important consideration for guidance in improvement and deletion or retention of a given material or product.

The records and data available may be classified as follows:

Analytical Data.—From the records covering botanical and chemical control of materials may be obtained information concerning articles of commerce, and serves as an index to the advisability of recommending changes in the adopted standards or formulating new standards for such materials as it may be desirable to include.

From the records available concerning strength, color, odor and similar prop-

erties, as obtained by chemicals or physiological assay, may be evolved new or improved standards bearing on the above-named criteria which are necessary to maintain uniformity. In addition thereto the constant application of such methods of control has the effect of producing modifications in procedure or equipment whereby greater accuracy may be assured.

Research Data.—Several manufacturers of pharmaceutical products have found it advantageous to the best interest of the profession of medicine to establish research laboratories wherein may be studied problems which have given promise of value in the treatment of disease; the result has been that many of the now staple and specific products or compounds may be pointed out as having originated in the manufacturers' laboratories, and evidence of the value of such development is shown in the list of proposed additions to the forthcoming Pharmacopoeia.

Manufacturing Data.—Experience gained by daily contact with the production of pharmacopoeial preparations shows wherein improvement may be suggested either through the introduction of more efficient equipment or through the use of a different solvent. Manufacturing experience may show depletion of a certain source of raw material and substitution of other materials and, therefore, changes in procedure governing the process and requirements of finished product may be recommended. Legislation, applying to the uses of alcohol for extraction purposes, has affected trade conditions; dealers who formerly used small amounts of alcohol now, with the increased cost and attendant difficulties of obtaining it, have turned to the pharmaceutical manufacturer for such classes of preparations as tinctures, elixirs, etc., which the larger consumer of alcohol has been able to obtain at better advantage and, more recently, at a lower cost, by utilizing specially denatured alcohols, some of which may find their way into the forthcoming Pharmacopoeia.

Permanence.—Coincident with the trend toward the purchase of certain galenical preparations—which were formerly manufactured in the drug store—in quantities to insure use in comparatively short time by the consumer or patient, there has arisen a problem in manufacturing these preparations on a large scale which will insure permanence in the face of temperature changes in transportation and while held in storage at convenient distributing points. This problem has opened the way toward investigation of methods to prevent discoloration, precipitation or other deterioration affecting the physical elegance of many products, with the result that any success attending such efforts may be offered for inclusion in the succeeding Pharmacopoeia, or, if the reverse be found, it may be suggested that such preparations be prepared extemporaneously.

Demand.—In the process of revision the desirability of adding or retaining or deleting an item is always beset with difficulty, since geographical location and climatic conditions may dictate the necessity for an article which may have little or no use in another section of the country. Many manufacturers of pharmaceuticals are national distributors and are in a position to supply information as to the demand for a given item, and reference to trade lists may reveal whether retention, deletion or addition is justifiable on basis of demand.

A general impression of the extent to which a manufacturer assists and is interested in the revision of the Pharmacopoeia may be gained from what has been set forth in this paper. The part played by any particular profession in the compilation of the U. S. P. may at times be magnified, but thoughtful reflection will

supply the evidence that the task of compiling and revising a book which serves in the several fields of medicine as a standard and formulary for such diversified preparations and compounds, is one which can only be accomplished through the hearty coöperation and combined efforts of all those concerned, governed and regulated by the Pharmacopoeia.

BROOKLYN, N. Y.

A SMALLER UNITED STATES PHARMACOPOEIA.

BY A. RICHARD BLISS, JR.

It is undoubtedly the opinion of the medical profession of to-day that the United States Pharmacopoeia is too large for practical use on the part of the physician, and that a properly applied, intelligent, eliminative process of sufficient scope, having for its object the exclusion of those portions that are generally looked upon as worthless or superfluous in the *practice of medicine*, would result in a *Tenth Revision* that would be more practical, of decidedly smaller bulk, and more generally consulted and actually *used* by the medical practitioner. The continued inclusion and admission of drugs and preparations, rather uniformly looked upon by *medical authorities* as useless or of questionable value, because of the "argument" that *some* physicians use them and that therefore they should be officially defined and recognized, has resulted in bringing about a condition in previous revisions that caused them to resemble rather a manufacturer's catalogue of specifications for numerous drugs, chemicals and preparations, than a book supposedly especially intended for *actual use* by the physician. The general impression concerning the original object of the United States Pharmacopoeia (and a correct impression) is that the book is intended to contain certain necessary data concerning *selected* drugs whose value in *Medicine* has been proved by results derived from extensive general experiences in their intelligent use and by scientific experimentation. Previous revisions have been getting farther and farther away from this object, and what might be called the commercial or manufacturing element has been more and more stressed until to-day, because of this change in the original United States Pharmacopoeial scope, a large number of the members of the medical profession look upon the work as something intended for the exclusive use of the pharmacist and the drug manufacturer. Another immediate result of this apparent state of United States Pharmacopoeial affairs is the tremendous growth and success of the proprietary and the patent medicine industries with their attending evils.

If the eliminative plan, adopted and applied by the Council on Pharmacy and Chemistry of the American Medical Association in the preparation of that valuable booklet entitled "Useful Drugs," were used in the preparation of the coming revision of the United States Pharmacopoeia, the Tenth Revision would doubtless prove as practical, as useful, as widely distributed, as frequently consulted, and as popular among physicians as "Useful Drugs." In fact there would be no need for a publication like "Useful Drugs!"

The writer, as a member of the United States Pharmacopoeia Revision Coöperative Committee of the A. O. A. C., in reviewing the "page proofs" of the proposed

text of the United States Pharmacopoeia X, has been impressed with the fact that some excellent eliminative work has already been carried out by the United States Pharmacopoeia Revision Committee, but believes that there are further opportunities for constructive elimination. No attempt will be made here to discuss all of the possible opportunities for the elimination of drugs that have presented themselves. Instead, one or two points that have possibly not been discussed in the recent literature concerned with the numerous phases of United States Pharmacopoeia revisions will be briefly mentioned.

Next to Preventive Medicine in the order of importance to-day most would undoubtedly place Specific Medicine. Modern chemical and pharmacological methods aim at the separation, the isolation, and the purification of Pure Principles or Active Principles, the exhaustive study of the properties of these principles, the perfect synthesizing of them, and finally possible improvements in such principles. This point is well illustrated by the history of cocaine with the final preparation of such products as beta-eucaine, novocaine, etc., compounds that are superior to cocaine for a number of reasons, the most important being that they are less toxic. The manufacture of ethylmorphine, the isolation and purification of the active principles of chaulmoogra oil, the isolation and manufacture of theobromine, arsphenamine ("salvarsan"), etc., are further illustrations of results of successful work in Specific Medicine. The successful work of Abel with epinephrine and that of Kendall with thyroxin, and the attempts that are being made to isolate the pure, active principles of such "biological products" as sera, vaccines, etc., illustrate similar work in a different field of Specific Medicine. Older than most of the above, however, are the isolations of such pure, active principles as strychnine from nux vomica, quinine from cinchona, morphine from opium, and numerous other principles from crude drugs. In the old days a physician was forced to prescribe a preparation of nux vomica, which contains at least three different alkaloids, when he wanted a strychnine action, opium (containing at least twenty-one alkaloids) or its preparations when he wanted a morphine action, etc., etc. To-day the tremendous advantages of accuracy in dosage, in place of the old approximate dose or guess, and rapid or almost instantaneous effects produced by the hypodermatic administration of pure, active principles are outstanding among other related advantages such as purity, strength, concentration, small bulk, size of dose, etc. Are these evident advantages of pure, active principles being applied as much as they might be in the work of elimination with pharmacopoeial revisions? Would not their application result in assisting in bringing about a smaller Pharmacopoeia? Why not continue the good work done when coca and its preparations were eliminated and cocaine and cocaine hydrochloride alone retained? Application is made below with several well-known official vegetable drugs.

Aloes.—Authorities advise that aloin is the best substance to use when an aloes action is desired. If this is true, why keep aloes in the Pharmacopoeia?

Belladonna Leaves and Root.—Practically every writer makes the statement that the action of belladonna and its preparations is that of atropine. Therefore why continue these crude drugs when there is no necessity for the use of the crude drugs or the galenical preparations as long as atropine can be so readily obtained in the pure state? Some may say that the plaster and the ointment of belladonna are advised and used by some authorities. Careful investigation of medical literature

will disclose the fact, however, that modern thought casts severe doubt on the value of local applications of these two preparations.

Red Cinchona.—Why continue this drug or even cinchona ("Yellow") when we have quinine, quinidine, cinchonine, cinchonidine, etc.? Shall we continue the red variety simply because of the fact that for some unknown reason the red variety is specified as an ingredient of Compound Tincture of Cinchona? Do either of the cinchonas possess any advantages over their pure active principles? Cinchona contains at least 20 alkaloids.

Cubeb and Aspidium.—The oleoresins are practically the only preparations employed to-day, so why retain the unused crude drugs?

Nux Vomica.—This is a drug that contains at least three alkaloids, in addition to numerous other constituents. With strychnine, a readily obtained alkaloid, representing its action, why continue the unnecessary crude drug?

Opium.—Here is another drug in the class with cinchona. It contains at least twenty-one alkaloids—truly a "shot-gun" collection! With morphine, codeine and their derivatives available there is no further need for continuing the crude drug.

Physostigma.—This drug is rarely, if ever, used. The continuation of its principal alkaloid, physostigmine, would suffice.

Pilocarpus.—Another drug practically unused as such. Pilocarpine, its principal alkaloid, is sufficient for all medical applications.

Stramonium.—This vegetable drug is not needed as long as atropine is obtainable.

Strophanthus.—Another crude drug whose galenical preparations are unused.

The following table shows what the adoption of this plan, which was used in the last revision of the United States Pharmacopoeia with the crude drug coca (cocaine and cocaine hydrochloride being alone retained), would accomplish with certain crude, vegetable drugs from the standpoint of the elimination of superflous drugs and their preparations.

Drug.	To be retained.	To be eliminated.
Aloes	Aloin	Crude Drug, Pills and Tincture
Aspidium	Oleoresin	Crude Drug
Belladonna	Atropine and Salts, Hyoscyamine and Scopolamine Hydrobromides	Crude Drugs (root and leaves), Fluidextract, Liniment, Extract, Tincture, and Ointment
Cinchona	Quinine and Salts, Cinchonine and Cinchonidine Sulphates	Crude Drugs (Yellow and Red), Fluidextract, Tincture, and Compound Tincture
ubeb	Oleoresin	Crude Drug
Hydrastis	Hydrastine and its Hydrochloride, and Hydrastinine Hydrochloride	Crude Drug, Extract, Fluidextract, Tincture, and Glycerite
Hyoscyamus	(See *Belladonna*)	Crude Drug, Extract, Fluidextract, and Tincture
Nux Vomica	Strychnine and its Salts	Crude Drug, Extract, Fluidextract, and Tincture

Drug.	To be retained.	To be eliminated.
Opium	Morphine, Codeine, and Salts and Derivatives	Crude Drug (also Powdered, Granulated, and Deodorized), Tincture, Camphorated Tincture, Tincture of Deodorized Opium, Powder of Ipecac and Opium
Physostigma	Physostigmine Salicylate	Crude Drug, Extract, and Tincture
Pilocarpus	Pilocarpine Hydrochloride and Nitrate	Crude Drug and Fluidextract
Stramonium	Nothing	Crude Drug, Extract, Tincture, and Ointment
Strophanthus	Strophanthin	Crude Drug and Tincture

Thus forty-nine (49) crude drugs and preparations would be eliminated.

Further applications might be made to the volatile oil drugs like anise, fennel, etc., and possibly to other groups.

Another possibly feasible modification would be the elimination of Part II, which is concerned with atomic weights, chemical formula, reagents and test solutions, tables, etc. (occupying 161 pages), *from volumes or a special edition intended for the use of the practicing physician*, since this would reduce not only the bulk of such issues but also the cost to physicians.

Lastly might be mentioned the unfortunate tendency, displayed in the revisions of the National Formulary, to include most, if not all, of those drugs and preparations discarded or rejected by the United States Pharmacopoeia. If this practice is continued the "N. F." will become the "dumping ground" of the U. S. P. and will lose its prestige and value.

LABORATORIES OF PHARMACOLOGY,
SCHOOL OF MEDICINE,
EMORY UNIVERSITY,
EMORY UNIVERSITY, GEORGIA.

DOSES PROPOSED FOR THE UNITED STATES PHARMACOPOEIA, TENTH REVISION.

The following list represents changes in the U. S. P. IX doses or the doses for newly admitted substances, as proposed for inclusion in the new Pharmacopoeia. All other doses remain as at present official. These are submitted for the information of physicians and pharmacists. Any comments should be sent to E. Fullerton Cook, 636 So. Franklin Square, Philadelphia, Pa.

Acidum Benzoicum, 1 Gm. (15 grains)
Acidum Citricum, Dose Omitted
Acidum Lacticum, Dose Omitted
Acidum Tartaricum, Dose Omitted
Aconitum, 0.06 Gm. (1 grain)
Antimonii et Potassii Tartras, 0.003 Gm. (1/20 grain)
Apomorphinae Hydrochloridum, Expectorant 0.002 (1/30 grain), Emetic, Hypodermic, 0.005 Gm. (1/12 grain)
Asafoetida, 0.2 Gm. (3 grains)
Aspidium, Dose Omitted
Atropina, 0.0006 Gm. (1/100 grain)
Atropinae Sulphas, 0.0006 Gm. (1/100 grain)
Barium Sulphate, No Dose
Benzosulphinidum, Dose Omitted
Bismuthi Betanaphtholas, 1 Gm. (15 grains)
Bismuthi Subcarbonas, 1 Gm. (15 Grains)
Bismuthi Subgallas, 1 Gm. (15 grains)
Bismuthi Subnitras, 1 Gm. (15 grains)
Bismuthi Subsalicylas, 1 Gm. (15 grains)
Calcii Chloridum, 1 Gm (15 grains)

Calcii Lactas, 1 Gm. (15 grains)
Calumba, 1 Gm. (15 grains)
Camphora, By mouth or Hypodermic 0.2 Gm. (3 grains)
Cerii Oxalas, 0.6 Gm. (10 grains)
Cubeba, 2 Gm. (30 grains)
Colocynthis, 0.1 Gm. (1 1/2 grains)
Chrysarobinum, Dose Omitted
Digitalis, 0.1 Gm. (1 1/2 grains)
Dakin's Solution, No Dose
Dextrose C. P., No Dose
Dichloramin T, No Dose
Extractum Aconiti, 0.015 Gm. (1/4 grain)
Extractum Cannabis, 0.015 Gm. (1/4 grain)
Extractum Cascarae Sagradae, 0.3 Gm. (1/2 grain)
Extractum Fellis Bovis, 0.4 Gm. (6 grains)
Extractum Hyoscyami, 0.05 Gm. (5/6 grain)
Extractum Rhei, 0.5 Gm. (8 grains)
Extractum Stramonii, 0.02 Gm. (1/3 grain)
Fluidextractum Aconiti, 0.06 cc (1/10 minim)
Fluidextractum Digitalis, 0.1 Gm. (1 1/2 minims)
Fluidextractum Ipecacuanhae, Expectorant 0.06 (1 minim), Emetic 1 cc (15 minims)
Fluidextractum Lobeliae, 0.1 cc (1 1/2 minims)
Fluidextractum Nucis Vomicae, 0.1 cc (1 1/2 minims)
Fluidextractum Podophylli, 0.3 cc (5 minims)
Fluidextractum Spigeliae, 4 cc (1 fluidrachm)
Fluidextractum Tritici, 8 cc (2 fluidrachms)
Fluidextractum Zingiberis, 0.5 cc (8 minims)
Glyceritum Acidi Tannici, 2.5 cc (40 minims)
Hexamethylenamina, 0.3 Gm. (5 grains)
Hydrargyri Chloridum Corrosivum, 0.004 Gm. (1/15 grain)
Hydrargyri Chloridum Mite, Laxative 0.15 Gm. (2 1/2 grains)
Hydrargyri Iodidum Rubrum, 0.004 Gm. (1/15 grain)
Hydrargyri Salicylas, Intramuscular 0.06 Gm. (1/10 grain) twice a week
Hyoscyaminae Hydrobromidum, 0.0006 Gm. (1/100 grain)
Hyoscyamus, 0.2 Gm. (3 grains)
Infusum Digitalis, 6 cc (1 1/2 fluidrachms)
Infusum Sennae Compositum, 30 cc (1 fluidounce)
Iodum, 0.01 Gm. (1/6 grain)
Ipecacuanha, Expectorant 0.06 Gm. (1 grain), Emetic 1 Gm. (15 grains)
Liquor Sodii Glycerophosphatis, 0.6 cc (10 minims)
Lobelia, 0.1 Gm. (1 1/2 grains)
Magma Magnesiae, Antacid 4 cc (1 fluidrachm), Laxative (for children) 15 cc (4 fluidrachms)
Magnesii Carbonas, Antacid 0.6 Gm. (10 grains), Laxative 8 Gm. (2 fluidrachms)
Magnesii Oxidum, Antacid 0.25 Gm. (4 grains), Laxative 3 Gm. (45 grains)
Magnesii Oxidum Ponderosum, Antacid 0.25 Gm. (4 grains), Laxative 3 Gm. (45 grains)
Massa Hydrargyri, 0.3 Gm. (5 grains)
Mistura Glycyrrhizae Composita, 4 cc (1 fluidrachm)
Morphinae Hydrochloridum, 0.01 Gm. (1/6 grain)
Morphinae Sulphas, 0.01 Gm. (1/6 grain)
Nux Vomica, 0.1 Gm (1 1/2 grains)
Oleoresina Aspidii, Single Dose, once a day, 4 Gm. (1 drachm)
Oleoresina Capsici, 0.015 Gm. (1/4 grain)
Oleum Anisi, 0.1 cc (1 1/2 minims)
Oleum Aurantii, 0.1 cc (1 1/2 minims)
Oleum Cari, 0.1 cc (1 1/2 minims)
Oleum Carophylli, 0.1 cc (1 1/2 minims)
Oleum Cassiae, 0.1 cc (1 1/2 minims)
Oleum Chenopodii, 1.0 cc (15 minims)
Oleum Coriandri, 0.1 cc (1 1/2 minims)
Oleum Foeniculi, 0.1 cc (1 1/2 minims)
Oleum Juniperi, 0.1 cc (1 1/2 minims)
Oleum Lavandulae, 0.1 cc (1 1/2 minims)
Oleum Limonis, 0.1 cc (1 1/2 minims)
Oleum Lini, Dose Omitted
Oleum Menthae Piperitae, 0.1 cc. (1 1/2 minims)
Oleum Menthae Viridis, 0.1 cc (1 1/2 minims)
Oleum Myristicae, 0.03 cc (1/2 minim)
Oleum Pimentae, 0.1 cc (1 1/2 minims)
Oleum Rosmarini, 0.1 cc (1 1/2 minims)
Oleum Sassafras, 0.1 cc (1 1/2 minims)
Oleum Thymi, 0.1 cc (1 1/2 minims)
Paraldehydum, 4 cc (fluidrachm)
Paraformaldehydum, Dose Omitted
Phosphorus, 0.0006 Gm. (1/100 grain)
Pilocarpinae Hydrochloridum, 0.005 Gm. (1/12 grain)
Pilocarpinae Nitras, 0.005 Gm. (1/12 grain)
Potassii Iodidum, 0.3 Gm. (5 grains); Antiluetic 2 Gm. (30 grains)
Potassii Nitras, 0.3 Gm. (5 grains)
Pulvis Aromaticus, 0.3 Gm. (5 grains)
Pulvis Ipecacuanhae et Opii, 0.3 Gm. (5 grains)
Sanguinaria, 0.1 Gm. (1 1/2 grains)
Scopolaminae Hydrobromidum, 0.0005 Gm. (1/120 grain)
Senna, 2 Gm. (30 grains)
Sodii Benzosulphinidum, Dose Omitted

Sodii Glycerophosphas, 0.3 Gm. (5 grains)
Sodii Iodidum, 0.3 Gm. (5 grains), Antiluetic 2 Gm. (30 grains)
Spiritus Anisi, 1 Gm. (15 grains)
Spiritus Juniperi, 1 cc
Spiritus Menthae Piperitae, 1 cc (15 minims)
Spiritus Menthae Viridis, 1 cc (15 minims)
Stramonium, 0.75 Gm. (12 grains)
Strophanthinum, Daily mouth or vein 0.0005 Gm. (1/120 grain)
Strychnina, 0.002 Gm. (1/30 grain)
Strychninae Nitras, 0.002 Gm. (1/30 grain)
Strychninae Sulphas, 0.002 Gm. (1/30 grain)
Syrupus Ipecacuanhae, 0.75 cc (12 minims), Emetic 15 cc. (4 fluidrachms)
Syrupus Picis Liquidae, 10 cc (2 1/2 fluidrachms)
Syrupus Pruni Virginianae, 10 cc (2 1/2 fluidrachms)
Syrupus Sennae, 8 cc. (2 fluidrachms)
Syrupus Tolutanus, 10 cc (2 1/2 fluidrachms)
Syrupus Zingiberis, 10 cc. (2 1/2 fluidrachms)
Thymol, 0.125 Gm. (2 grains), Anthelmintic 2 Gm. (30 grains) divided into 3 doses
Thyroideum Siccum, 0.06 Gm. (1 grain)
Tinctura Aconiti, 0.6 cc (10 minims)
Tinctura Belladonnae, 0.6 cc (10 minims)
Tinctura Cannabis, 1 cc (15 minims)
Tinctura Digitalis, 1 cc (15 minims)
Tinctura Ferri Chloridi, 0.7 cc (10 minims)
Tinctura Gelsemii, 0.3 cc (5 minims)
Tinctura Myrrhae, 2 cc (30 minims)
Tinctura Nucis Vomicae, 1 cc (15 minims)
Tinctura Opii, 0.6 cc (10 minims)
Tinctura Opii Deodorati, 0.6 cc (10 minims)
Tinctura Stramonii, 0.75 cc (10 minims)
Tinctura Veratri Viridis, 1 cc (15 minims)
Valeriana, 0.75 Gm. (12 grains)
Veratrum Viride, 0.1 Gm. (1 1/2 grains)
Zingiber, 0.5 Gm. (8 grains)

THE ALCOHOLIC STRENGTH OF NATIONAL FORMULARY PREPARATIONS.

BY WILBUR L. SCOVILLE.

The next edition of the NATIONAL FORMULARY will state the alcoholic strengths of the various N. F. preparations used internally. Since the alcoholic content of drug percolates will vary even when the same menstruum is used, owing to variations in the moisture and soluble constituents of the drugs, it is only by a considerable series of experiments that an average or standard alcoholic content of any fluidextract or tincture can be known. The NATIONAL FORMULARY Committee has therefore appealed to the drug manufacturers for data on which to base the alcohol standards. More than forty manufacturers were asked to furnish a statement of the alcoholic strengths of 67 listed elixirs, 83 fluidextracts, 9 solutions and 42 tinctures—all NATIONAL FORMULARY products or new additions to the Formulary. This list of over 200 preparations calls for considerable work in looking up records and checking up processes, since the request specified that data were wanted on preparations made according to the N. F. formulas only. And it is evident that the manufacturers are quite willing to aid the N. F. even at a material cost to themselves when replies giving the data requested were received from twenty manufacturers including most of the largest pharmaceutical manufacturers—and from others who stated that their list of N. F. products was too small to be of any real service.

The NATIONAL FORMULARY Committee wishes to acknowledge with thanks the cordial coöperation of the manufacturers in this work of revision.

The data thus collected are summarized in the following tables. It will be noted that but a few of the preparations listed are made by all the manufacturers, and some are made by only one or two. In many instances, particularly the elixirs, the N. F. formulas are replaced by private formulas, which differ mostly

in the menstrua and flavors or color used, and hence in the alcoholic strength. This will account for some wide variations in the elixirs—the standards in medicinal activity being the same as, or very close to, the N. F. standards, but the alcoholic strength and flavor vary.

Another cause of variation lies in the fact that while most of the large manufacturers state the actual alcoholic content of their preparations on the label—within an allowable variation—some give simply a minimum and others a maximum strength. The figures therefore show the extremes as stated and suggest a wider variation than actually occurs.

The averages stated in the table are not, except in a few cases, the numerical average of all the figures, but are the figures nearest to that reported by a majority of the manufacturers. For instance, six reports on Elixir of Ammonium Bromide gave the figures 20%, 7%, 16%, 7%, 7% and 23%. Since it is obvious that the same formula is not followed in all of these and three of the six reported 7%, which is close to the calculated strength by the N. F. formula, the average is given as 7% rather than 80 divided by 6 which equals 13%.

When the figures varied so much that a majority average was not evident the calculated average is given. A striking illustration of the variations sometimes shown is exhibited in the report on Fluidextract of Lupulin. Eleven manufacturers give the following figures on this, *viz.:* 52%, 53%, 57%, 60%, 60%, 65%, 68%, 75%, 80%, 85% and 87%—a range of 52% to 87%! Since alcohol is the official menstruum for this preparation and is probably used in all of the above (for I can say that a high-grade lupulin yields so much soluble extractive to alcohol that the fluidextract content will be reduced to as low as 52% without water), the differences in strength are doubtless due to variations in the quality of lupulin used. This illustrates the difficulty of establishing a fair alcoholic standard on preparations of variable drugs.

In giving the number of manufacturers who reported the stated average, a variation of 1% in alcohol is usually included. For instance, if the average is 40%, all who reported 39%, 40% or 41% are included as reporting the average. Any greater variation than 1% of alcohol is not included.

It is also plain that if the NATIONAL FORMULARY establishes an alcoholic standard for preparations some allowance for variations should be permitted. The U. S. Pharmacopoeia IX gives the alcoholic standard on 76 of its preparations, mostly spirits and tinctures, and permits a variation of 10% more or 10% less from the figures given. But a 10% allowance on an 8% standard is only 0.8% each way, while a 10% allowance on a 90% standard is 9% each way, or an extreme variation in one case of 1.6% and of 18% of alcohol in the other case. Therefore some manufacturers think that a sliding allowance should be made, and the following scales are advocated:

"A" proposes an allowance of 4% for 90% strengths, 5% for 75% strengths, 6% for 60% strengths, 8% for 40% strengths and 10% for 25% strengths or under. For fluidextracts he advocates a 10% allowance for all strengths.

"B" allows the following deviations from the figures reported:

50% or more,	deviation allowed	10%	of the	alcohol.
20% to 50%,	"	"	15%	"	"	"
10% to 20%,	"	"	20%	"	"	"
1% to 10%,	"	"	25%	"	"	"

"C" writes that an allowance of 10% either way is made in practice, but that "sometimes this is too great an allowance and sometimes not enough."

"D" writes that their usual allowance is 5%, but it is sometimes stretched to 10%. Most of the others state that an allowance of 10% is made on the figures given.

Since the variations in alcoholic strength are due mainly to differences in amount of extractive in the different lots of drug used, it is plain that an allowance of 10% in a tincture is more liberal than 10% in a fluidextract, regardless of the alcoholic strength, because tinctures usually represent only one-twentieth to one-fifth as much extractive as the corresponding fluidextracts. Hence the character of the preparation should be considered as well as the alcoholic strength. But it also seems reasonable that a greater percentage variation should be allowed on weakly alcoholic preparations than on strongly alcoholic ones.

One manufacturer of the highest ethical standing, whose name is universally respected, writes the following frank protest against rigid alcoholic standards, which merits attention:

Re Alcohol Content of Fluidextracts.

"I wish to give formal expression to my objection to hard and fast exact standards for alcohol percentages of fluidextracts, official or not.

"There never was any sense in requiring that labels of these products should bear a statement of their alcohol content, but one need not hark back to that grievance.

"The requirement exists. Each manufacturer is responsible for the truth of his declaration on the label. For the official fluidextracts formulas are given with detailed instructions which do not provide for standardizing of the alcohol content. The instructions, however, leave room for considerable variations in the finished product.

"The only rational plan, it seems to me, is for each manufacturer to follow the official instructions and ascertain experimentally the average alcoholic strength of each fluidextract, and label them accordingly, with the general understanding that a margin of ten percent above or below the stated strength is to be tolerated in this class of products.

"The refinement of fixing an absolute standard to which each fluid is to be adjusted within a very narrow range is not required by the regulations provided and adds needlessly to the cost of production, while it may affect injuriously the quality of the product. It has never occurred to us to make such a fetish of standardization. It is easy to see that nothing whatever is gained thereby even if by agreement the several manufacturers agree to adopt arbitrarily exact standards.

"Theoretically, the law was made to guard against danger of intoxication from these concentrated medicaments.

"I shall certainly continue, as heretofore, to oppose the fixing by law of unnecessary hard and fast standards of this sort. They may serve perhaps to divert attention from wholesale evasions and actual violations of our prohibition laws."

The problem of establishing alcoholic standards is therefore not an easy one. The NATIONAL FORMULARY certainly does not aim to establish arduous or unfair, or even needlessly troublesome, standards. Its whole aim is to safeguard the honest and reputable preparation. Hence further suggestions or criticisms on this subject will be welcomed and sincerely considered.

Following are the data thus far received with a suggested standard for each preparation listed.

The revision of the elixirs is only partially completed and changes in alcoholic strength are contemplated on some, hence the suggested standards are incomplete.

The following changes in menstrua for fluidextracts have been tentatively adopted which accounts for the apparent discrepancies in the suggested N. F. standards for these fluidextracts.

Fluidextract Angelica Root—from 95% alcohol to five volumes of alcohol and one of water.

Fluidextract Apocynum—from one of glycerin, six of alcohol and three of water to three of alcohol and two of water (glycerin eliminated).

Fluidextract Buchu Comp.—from two of alcohol and one of water to four of alcohol and one of water.

Fluidextract Calendula—from 95% alcohol to two of alcohol and one of water.

Fluidextract Dioscorea—from four of alcohol and one of water to diluted alcohol.

Fluidextract Euonymus—from four of alcohol and one of water to diluted alcohol.

Fluidextract Juniper—from diluted alcohol to four of alcohol and one of water.

Fluidextract Leptandra—from diluted alcohol to three of alcohol and one of water.

Fluidextract Mezereum—from four of alcohol and one of water to two of alcohol and one of water. (The wisdom of this change is questioned. W. L. S.)

Fluidextract Sanguinaria—from citric acid to hydrochloric acid.

Fluidextract Stillingia Comp.—from one of glycerin, two of alcohol and one of water to diluted alcohol.

Fluidextract Stramonium—from two of alcohol and one of water to four of alcohol and one of water.

These changes necessitate new alcoholic standards for the fluidextracts. The danger of standardizing by calculation, on the basis of the old data, is recognized, for a change in menstruum means a change in extractive which influences the alcoholic strength, and this change cannot be calculated. Yet the opportunity of making and examining samples is very meager. Perhaps the best method of handling these standards is to allow of a larger variation in each case until sufficient data can be gathered to warrant the standards to be finally adopted.

Further data or suggestions on this subject will be welcomed by the Committee.

TABULATED REPORTS OF ALCOHOLIC STRENGTH NATIONAL FORMULARY PREPARATIONS AND SUGGESTION FOR N. F. STANDARD.

Preparation.	Number reporting.	Lowest percentage.	Highest percentage.	Average percentage.	Number below average.	Number above aver.	Number reporting aver.	Suggested N. F. standard.
Elix. Ammon. Brom	6	7	23	7	0	3	3	7
" Ammon. Valer	8	17	24	22	4	1	3	21
" Aletris Co	7	15	25	21	2	1	4	..
" Amygdal. Co	3	4	5	5	1	0	2	4
" Anise	4	22	24	23	1	1	2	5
" Antiasthmat	8	15	25	19	1	2	5	18
" Arom. Rub	5	11	24	22	2	1	2	22
" Aurant. Amar	4	29	32	29	0	1	3	28
" Bismuth	6	10	18	12	2	1	3	12
" Buchu	6	30	40	34	2	1	3	34
" Buchu Co	7	28	32	30	1	1	5	30
" Buchu Junip. et Pot. Acet	5	24	31	25	1	2	2	28
" Buchu et Pot Acet	7	18	40	28	3	3	1	28
" Calc. et Sod. Glyc'phos	6	7	13	7	0	2	4	7
" Calc. Lactophos	3	20	20	20	0	0	3	20
" Card. Co	3	9	10	10	1	0	2	10

Preparation.	Number reporting.	Lowest percentage.	Highest percentage.	Average percentage.	Number below average.	Number above aver.	Number reporting aver.	Suggested N. F. standard.
Elix. Cascar. Sagr.	7	16	24	22	3	1	3	8
" Cascar. Sagr. Co.	4	24	25	..	..	..	4	24
" Gent. et Ferr. Phosph.	2	13	20	..	..	..	..	18
" Gent. Glycerin.	9	9	14	11	1	1	7	11
" Glycerophos. Co.	6	4	12	12	3	0	3	12
" Glycyrrh. Aq.	2	3	4	..	..	..	..	3
" Glycyrrh. Arom.	3	22	24	22	0	1	2	22
" Guar.	6	22	32	26	1	2	3	26
" Guar. et Apii.	7	15	26	19	4	2	1	30
" Hydrastis Co.	1	..	..	25	..	..	..	..
" Hydrang. et Lith.	5	18	40	20	2	3	0	25
" Helonias Co.	8	15	22	20	4	2	2	18
" Manac. et Salicyl.	8	5	25	17	1	3	4	20
" Pepsin.	4	15	16	16	1	0	3	15
" Pepsin Bism. et Strych.	8	10	17	11	1	2	5	10
" Pepsin et Bism.	10	10	18	11	2	1	7	10
" Pepsin. et Rennin. Co.	6	17	35	20	2	1	3	20
" Phosphor.	7	30	33	32	1	3	3	32
" Phosphor. et Nuc. Vom.	4	18	34	34	2	0	2	34
" Cathart. Co.	7	14	31	25	2	3	2	25
" Catar. et Foenic.	2	15	25	..	..	..	..	16
" Cinchon.	8	12	24	20	2	2	4	..
" Cinchon. et Ferr.	4	15	22	20	1	1	2	..
" Cinchon. Ferr. Bism. et Strych.	4	12	20	20	1	0	3	..
" Cinchon. Ferr. et Bism.	3	19	20	19	0	1	2	..
" Cinchon. Ferr. et Strych.	7	18	22	22	21	0	3	..
" Coryd. Co.	5	20	40	25	1	2	2	25
" Eriodict. Arom.	3	10	16	16	1	0	2	15
" Creos et Terpin. Hyd.	4	6	25	..	..	..	..	25
" Digestiv. Co.	4	10	15	15	2	0	2	15
" Dioscor. Co.	5	17	22	20	2	1	2	20
" Ferr. Pyrophos. Quin. et Strych.	6	9	24	18	2	3	1	..
" Ferr. Quin. et Strych.	11	9	25	24	5	3	3	..
" Five Bromides.	5	0	16	9	1	2	2	4
" Four Chlorides.	4	0	22	10	2	2	0	..
" Gent.	9	20	22	21	..	..	9	20
" Gent. et Ferr.	9	13	22	20	5	1	3	20
" Pot. Brom.	9	6	16	7	2	1	6	7
" Sabal et Santal. Co.	8	15	30	20	1	4	3	26
" Sod. Brom.	5	6	7	6	0	1	4	7
" Sod. Sal.	5	7	21	7	0	2	3	7
" Sod. Sal. Co.	4	20	24	24	1	0	3	24
" Tarax. Co.	4	25	30	28	1	1	2	28
" Terpin. Hyd.	7	35	45	41	2	1	4	40
" Terpin. Hyd. et Codein.	8	35	45	41	4	1	3	40
" Terpin. Hyd. et Diacetylmorph.	8	35	42	40	2	3	3	40
" Tonga Co.	7	18	28	22	3	3	1	22
" Tri. Brom.	6	0	20	10	2	3	1	4
" Vanil. Co.	2	10	10	10	0	0	2	10
" Viburn. Opul. Co.	5	18	37	30	1	2	2	34
" Viburn. Prun.	2	29	29	29	0	0	2	28
Fldext. Adonid.	7	58	65	62	3	3	1	60
" Aletrid.	11	37	45	40	2	3	6	40

Preparation.	Number reporting.	Lowest percentage.	Highest percentage.	Average percentage.	Number below average.	Number above aver.	Number reporting aver.	Suggested N. F. standard.
Fldext. Angel. Rad	8	80	90	85	1	2	5	68
" Apii Fruct	10	80	88	85	3	2	5	85
" Apocyn	13	44	55	48	5	4	4	48
" Aral	10	50	57	55	3	3	4	54
" Arnic	13	36	60	40	2	4	7	40
" Asclepiad	13	37	43	40	2	3	8	40
" Baptis	11	40	65	63	5	2	4	60
" Berberid	13	35	45	44	6	1	6[1]	40
" Boldi	6	80	90	85	3	3	0[2]	82
" Buchu Co	10	50	56	52	4	4	2[3]	52
" Calend	11	75	87	80	1	3	7	60
" Calumb	14	59	71	64	6	3	5[4]	65
" Castan	12	16	20	18	1	1	9[5]	16
" Catar	7	20	40	33	2	3	2	35
" Caulophyl	13	54	70	60	2	3	8	60
" Chimaphil	10	30	41	38	3	3	4	36
" Chionanth	12	45	61	56	4	4	4	55
" Chirat	6	40	46	43	1	2	3	42
" Cocillan	5	63	68	65	1	1	3	65
" Coff	7	18	23	20	1	2	4	20
" Colch. Corm	14	48	60	55	6	2	6	52
" Condurango	13	36	45	42	5	3	5	40
" Conval. Rad	12	48	65	56	4	7	1	58
" Copt	4	35	43	40	2	2	0	40
" Corni	8	30	42	37	3	3	2	40
" Corydal	8	60	66	63	2	4	2	62
" Cubeb	14	72	90	75	4	5	5	75
" Cypriped	13	30	43	40	2	4	7	40
" Damian	14	50	65	60	4	6	4	60
" Dioscor	13	64	74	65	1	6	6	40
" Droser	4	55	60	55	0	3	1	55
" Dulcam	10	33	43	40	2	5	3	40
" Echin	13	65	73	68	5	6	2[6]	65
" Euonym	13	60	70	66	2	5	6	42
" Eupator	12	35	43	40	5	2	5	40
" Euphorb. Pilul	13	35	43	40	2	5	6[7]	40
" Fuci	8	56	68	65	3	2	3	65
" Galeg	9	39	45	42	3	2	4	42
" Geran	10	43	56	50	5	1	4[8]	50
" Gossyp. Cort	13	78	91	85	4	3	6	83
" Hamamel. Fol	15	20	25	23	5	4	6[9]	22
" Helon	13	35	45	40	5	5	3	40
" Humul	9	42	54	50	4	4	1	50
" Hydrang	14	45	60	50	2	5	7	50
" Iri. Ver	13	65	90	80	5	4	4	80
" Jalap	11	77	87	80	3	3	5	80
" Jugland	13	35	45	40	5	2	6	38
" Junip	12	30	45	35	5	3	4	50
" Kav	14	45	65	55	9	1	4[10]	52
" Kol	13	49	65	56	4	4	5	55
" Kramer	11	30	40	38	5	3	3	36
" Lapp	15	37	45	40	5	4	6[11]	38
" Leptand	13	30	42	40	3	3	7	60

Preparation.	Number reporting.	Lowest percentage.	Highest percentage.	Average percentage.	Number below average	Number above aver.	Number reporting aver.	Suggested N. F. standard.
Fldext. Lupulin	11	52	87	67	6	4	1[12]	55
" Matic	10	55	63	60	2	3	5	60
" Mezer	5	66	75	70	2	1	2	(?)
" Pareir	9	35	43	40	2	2	5	40
" Phytolac	14	35	48	40	3	2	9	40
" Prun. Virg	13	14	22	18	6	2	5	17
" Quass	14	20	31	24	1	7	6	24
" Querc	6	35	43	41	2	1	3	40
" Rham. Cathart	8	22	45	40	2	3	3	40
" Rhois Glab	10	35	42	40	4	1	5	38
" Rubi	11	34	41	40	4	1	6	38
" Rumic	12	35	43	40	3	1	8	40
" Sanguin	14	51	64	60	3	5	6	58
" Scopar	11	36	43	40	1	4	6	40
" Scutellar	13	36	42	40	3	1	9	40
" Senecio	43	37	58	55	5	1	7	55
" Serpentar	11	63	72	68	5	6	0[13]	65
" Solan	7	30	58	55	3	2	2[14]	50
" Stilling. Co	2	38	40	..	..	..	..	38
" Stramon	13	49	57	55	4	1	8	65
" Thuj	8	75	90	80	1	3	4	80
" Trifol	11	32	64	40	1	4	6[15]	40
" Thym	7	15	26	18	1	3	3	18
" Trill	8	49	65	65	4	0	4	60
" Valer	13	60	70	66	2	6	5	65
" Verbasc. Fol	6	38	43	40	1	2	3	40
" Viburn. Opul	13	50	59	50	0	7	6	50
" Zea	9	20	42	30	5	3	1	38
Liquid Antisept	6	20	28	28	2	0	4	28
" Antisept. Alk	6	4	6	6	2	0	4	5
" Bism	4	9	12	12	1	0	3	12
" Ferr. Albumin	2	20	21	..	..	..	..	20
" Ferr. Pepton	3	14	20	20	1	0	2	18
" Ferr. Pepton et Mangan	7	14	18	14	0	1	6	18
" Pancreat	2	6	6	6	0	0	2	6
" Pepsin. Aromat	2	3	3	3	0	0	2	3
" Pic. Carbon	1	..	..	76	..	..	..	75
Tinct. Aloe et Myrrh	13	60	75	67	5	3	5	65
" Amar	4	58	62	60	2	1	1	60
" Antiperiod	13	52	55	55	3	0	10	55
" Antiperiod s. Aloe	11	53	56	55	1	1	9	55
" Arom	3	60	62	62	1	0	2	60
" Bryon	10	89	94	90	2	3	5	90
" Cact. Grand	6	68	90	80	2	2	2	80
" Calend	7	85	92	90	1	1	5	(?)
" Capsic. et Myrrh	12	77	85	83	6	3	3[16]	82
" Caramel	4	22	24	23	1	1	2	..
" Cimicifug	12	80	94	90	3	4	5	90
" Coccul. Ind	3	45	46	46	1	0	2	45
" Croc	3	45	46	46	1	0	2	45
" Cubeb	9	80	93	87	3	3	3	87
" Delphin	3	89	92	90	1	1	1	90
" Ferr. Citro-Chlor	11	11	15	15	2	0	9	14

Preparation.	Number reporting.	Lowest percentage.	Highest percentage.	Average percentage.	Number below average.	Number above aver.	Number reporting aver.	Suggested N. F. standard.
Tinct. Ferr. Pomat	3	95	10	10	1	0	2	10
" Gall	3	85	89	85	0	1	2	85
" Guaiac. Co	4	40	46	46	2	0	2	45
" Humul	4	45	46	..	2	2	..	45
" Ignat	5	70	83	80	1	2	2	80
" Iod. Fort	6	60	70	65	3	1	2	65
" Iod. Decolor	8	70	85	75	2	3	3	75
" Ipecac et Opii	6	12	45	13	1	3	2	12
" Jalap	3	56	61	60	1	1	1	60
" Jalap. Co	3	60	62	60	0	1	2	60
" Kramer	7	35	46	46	2	0	5	45
" Opii Crocat	3	45	46	45	1	0	2	45
" Passiflor	6	43	48	45	1	1	4	45
" Pectoral	3	45	50	48	1	1	1	48
" Persion	6	55	73	66	1	3	2	65
" Persion. Co	4	25	30	30	3	0	1	28
" Pulsatil	5	55	71	70	1	1	3	70
" Quillaj	4	27	33	32	1	1	2	30
" Rhei Aq	3	..	..	10	..	..	3	10
" Rhei Dulc	5	42	46	46	1	..	4	45
" Rhei et Gent	4	45	46	46	1	0	3	45
" Sabal. et Santal	3	72	75	74	1	1	1	74
" Serpent	5	55	60	60	1	0	4	60
" Sumbul	4	60	65	60	0	1	3	60
" Vanill	9	38	44	40	1	3	5	38
" Viburn. Opul. Co	7	65	71	70	4	0	3	68

[1] 5 reported 40%. [2] 2 reported 80%, 2 reported 90%. [3] 4 reported 50%, 4 reported 55%. [4] 10 reported 60 to 65%. [5] One reported 30%. [6] 5 reported 65%, 4 reported 70%. [7] 4 reported 42%. [8] 3 reported 45%. [9] 4 reported 20%, 4 reported 25%. [10] 4 reported 52%. [11] 4 reported 38%. [12] Reports very variable. [13] 4 reported 65%, 4 reported 70%. [14] Only one reported below 50%. [15] Only one below 39%, and 1 above 43%. [16] 3 reported 80%, 3 reported 85%.

DETROIT, JUNE 1922.

THE OPINION OF TEACHERS CONCERNING DEGREES IN PHARMACY.

BY J. G. BEARD.*

In November of 1921 a postal questionnaire was sent to all Conference teachers of professorial rank that had for its object the obtainment of their opinions on the subject of degrees in pharmacy. Ninety-six replies have been received and as this number represents nearly eighty percent of the professors addressed and as these answers are representative of opinion generally it seems unnecessary to delay further in reporting the facts received.

The queries listed on the questionnaire were six in number and were phrased substantially as follows:

Query No. 1. Do you believe the doctor's degree should be offered in pharmacy?

Query No. 2. If so, how many years of study should be required of applicants for the degree?

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* School of Pharmacy, University of North Carolina.

Query No. 3. What abbreviation should be used for the degree?
Query No. 4. Are you satisfied that the present Ph.G. degree is the proper undergraduate degree?
Query No. 5. If not, what is your preference?
Query No. 6. As a four-year degree what is your preference?

The chart below lists the names of the professors and their answers to questions 1, 2, 3, 4, 5 and 6. Numerous footnotes are necessary because so many teachers qualified their answers or else couched their replies in a fashion not to be condensed in the spaces provided by the chart. In so far as possible the phraseology of the replies is retained in the footnotes.

Name.	1.	2.	3.	4.	5.	6.
Alabama Polytechnic Institute						
L. S. Blake	Yes	6[1]	P.D.	Yes	....	B.S. (Phar.)
Brooklyn College of Pharmacy						
W. C. Anderson	Yes	5	Phar.D.	Yes	....	B.S. (Phar.)
A. P. Lohness	Yes	4	Phar.D.	No[2]	Phar.D. or Ph.C.	Phar.D.
J. L. Mayer	Yes	5	Phar.D.	Yes	....	B.Sc. (Phar.)
Buffalo University (N. Y.)						
W. G. Gregory	Yes	6	Phar.D.	Yes	....	Phar.B.[3]
A. B. Lemon	Yes	6[4]	Phar.D.	No	Phar.B.	Ph.C.
University of Southern California						
L. J. Stabler	No	..	.....	Yes	....	B.S. (Phar.)
Columbia University						
H. V. Arny	Yes	5	Phar.D.	Yes	....	B.S. (Phar.)
C. W. Ballard	Yes	6	Phar.D.	..	....[5]	B.Sc. (Phar.)
G. C. Diekman	Yes	6.	Phar.D.	Yes	....	B.S. (Phar.)
J. Hostmann	Yes	4 or 6[6]	Phar.D.	Yes	....	B.S. (Phar.)[7]
W. B. Simpson	Yes	6	Phar.D.	..	....	B.S. (Phar.)
C. P. Wimmer	Yes	6	Phar.D.	Yes	....	B.S. (Phar.)
Creighton University (Neb.)						
V. J. Fitz-Simon	No	..	.....	Yes[8]	....	Ph.C.[9]
H. C. Newton	No	..	.....	Yes	....	B.S. (Phar.)
W. J. Nolan	No	..	.....	Yes	....	B.S. (Phar.)
Des Moines University (Iowa)						
E. O. Kagy	Yes	4	Phar.D.	Yes	....	Phar.D.

[1] 2 years beyond B.S. degree.
[2] Never favored Ph.G. degree.
[3] Prefer Ph.C. as 3-year degree.
[4] As required by National Syllabus.
[5] Would rather consider it a "diploma title" and not as a degree.
[6] 4 years, 6 days, or 6 years as in Columbia.
[7] B.S. for 6-year degree.
[8] For 3 years' work.
[9] For 4 years' work.

Fordham University (N. Y.)						
J. Diner	Yes	6	Phar.D.	No	B.S. (Phar.)	B.S. (Phar.)
G. Horstmann	Yes	6	Phm.D.	No	Ph.B.	Ph.M.
George Washington University						
H. E. Kalusowski	Yes	..[10]	Phar.D.	No	....[11]	B.S. (Phar.)
University of Illinois						
W. B. Day	Yes[12]	8	Ph.D. (Phar.)	Yes[13]	Ph.C.[3]	B.S. (Phar.)
E. N. Gathercoal	Yes	8	Ph.D. or Phar.D.	Yes	Ph.C.[3]	B.S. (Phar.)
C. M. Snow	Yes	7	Ph.D.	Yes	....	B.S. (Phar.)[14]
State University of Iowa						
C. S. Chase	Yes	6	Phar.D.	Yes	....	No choice
Z. M. Cooper	Yes	6	Phar.D.	No	Ph.C. and B.S. (Phar.)	B.S. (Phar.)
R. A. Kuever	Yes	7	Ph.D.	No	....[15]	B.S. (Phar.)
W. J. Teeters	No	..	.....	No	Ph.C.[3]	B.S. (Phar.)
University of Kansas						
B. D. Havenhill	Yes	6	Phr.D.	Yes[16]	....	Phr.B.
L. E. Sayre	Might well	4	Phar.D.	Yes	....	B.S.[17]
G. N. Watson	Yes	6	Phr.D.	Yes	....	Ph.B.[18]
Louisville College of Pharmacy (Ky.)						
O. C. Dilly	Yes	4	Phar.D.	Yes	....	Phar.D.
H. O. Haeusgen	Yes	4	Phar.D.	Yes	....	Phar.D.
University of Maryland						
C. C. Plitt	Yes	6 or 7	Phar.D. or Ph.D. (Phar.)	Yes	....	Ph.B.
Massachusetts College of Pharmacy						
T. J. Bradley	No[19]	6	Phm.D.	Yes	....	B.S. (Phar.)
J. O. Jordan	No	..	.....	Yes	....	Ph.C.
E. H. LaPierre	No	..	.....	Yes	....	Phar.D.
H. H. Smith	Yes	4[20]	Phar.D.	Yes	....	Phar.D.
University of Michigan						
H. W. Emerson	No	6	Phm.D.	No	....	Ph.B.
A. F. Schlichting	..[12]	7	Ph.D.	No[21]	B.S. (Phar.)	B.S.(Phar.)
C. H. Stocking	Yes	6	Phar.D.	Yes	....	B.S.

[10] It should be given after graduation for any work of distinction.

[11] Any degree corresponding to university degree given for a specified amount of study.

[12] Only as Doctor of Philosophy in Pharmacy.

[13] For 2 years.

[14] Should not differ from other sciences.

[15] Indeed not. Minimum course of 4 years leading to the degree of B.S. (Phar.).

[16] Phr.G.

[17] B.S. superimposed upon a Ph.C. (3-year course).

[18] A Ph.M. should be offered for 5 years of study.

[19] No, except for graduate work—2 years of graduate work after 4 years of undergraduate.

[20] With at least 2 years of preliminary college course.

[21] No. A 4-year minimum.

University of Minnesota						
G. Bachman	Yes	6	Phm.D.	Yes	....	Phm.B.
E. D. Brown	Yes	..[22]	Phm.D.	No	Ph.B.	Ph.M. or Ph.C.
E. L. Newcomb	Yes	5 or 6	Phar.D. or Phm.D. or Pharm.D.	Yes	Ph.C.[23]	B.S. (Phar.)
C. H. Rogers	Yes	..[24]	Sc.D. (Phar.) or Ph.D. (Phar.)	No	Ph.C.	B.S. (Phar.)
F. J. Wulling	Yes	6	Phm.D.	No	B.S. (Phm.)[25]	B.S. (Phm.)
University of Mississippi						
H. M. Faser	Yes	6	Phm.D.	No	Ph.C.[23]	B.S. (Phar.)
University of Montana						
J. Sucky	Yes	7	Phar.D.	No	Ph.C.	Ph.B.
University of Nebraska						
R. A. Lyman	Yes	4 or 6[26]	Phar.D.	..[27]	....	B.Sc. (Phar.)[28]
A. Schneider	Yes	5 or 6	P.D.	Yes	....	Ph.B. or B.S.
University of North Carolina						
E. V. Howell	Yes	4	P.D.	Yes	....	P.D.
J. G. Beard	Yes	4	P.D.	Yes	....	P.D.
North Pacific College (Ore.)						
H. C. Miller	Yes	3[29]	P.D.[30] or Ph.C.	No[31]	....	....[32]
Notre Dame (Ind.)						
R. L. Green	No	..	.....	No	....[33]	Ph.B.
State University of Ohio						
C. A. Dye	No[34]	6	Ph.D.	No	....	B.Sc. (Phar.)
State University of Oklahoma						
D. B. R. Johnson	Yes	6	P.D.	No	....[3]	Ph.B. or B.S.

[22] 3 years after Ph.G. degree—same as in medicine.

[23] For 3-year course.

[24] Sc.D. (Phar.)—6 year, Ph.D. (Pharmacy-major)—7 year.

[25] Would abolish Ph.C., Ph.B., Ph.M. and give only B.S. at end of minimum course of 4 years. A doctor's degree should only be offered as a post-graduate degree.

[26] Not less than 4 or perhaps 6. It ought to represent an amount of study equal to that required in medicine.

[27] Ph.G. is not a degree and never can be. As a "designation" I think it preferable to any for short course.

[28] B.Sc. in Pharmacy only logical one and comparable to what is offered in Agriculture, Engineering, etc.

[29] After proper foundation has been laid.

[30] According to course given.

[31] Abandon Ph.G.

[32] Increase requirements for admission and complete professional training in 3 years.

[33] Certificate of proficiency.

[34] Not as such.

Agr. College of Oregon						
H. B. McWilliams	No[12]	6	Ph D.	Yes[35]	....	B.S. (Phar.)
A. Ziefle	Yes	6	Phar.D.	Yes[36]	....	B.S. (Phar.)
Philadelphia College of Pharmacy and Science (Pa.)						
E. F. Cook	Yes	6	Phar.D.[37]	Yes	....	Ph.B.
R. P. Fischelis	Yes	6	Phar.D.	Yes	....	B.S. (Phar.)
C. H. LaWall	Yes	6[19]	Phar.D.	No	....	B.Sc. (Phar.)
J. W. Sturmer	Yes	6[19]	Phar.D.	No	....	B.Sc. (Phar.)
C. E. Vanderkleed	Yes	..[19]	Phar.D.	Yes[8]	....	B.S. (Phar.)
H. W. Youngken	Yes	6	Phar.D.	Yes	....	B.Sc. (Phar.)
University of Pittsburgh (Pa.)						
J. H. Beal	Yes	3 or 4	Phr.D	Yes	....	Phr.D.
F. J. Blumenschein	Yes	4	Phr.D.	Yes	....	Phar.D. (Phr.)
L. K. Darbaker	Yes	4	Phar.D.	Yes	....	Phar.D.
A. F. Judd	Yes	4	Phar.D.	Yes	....	....
J. A. Koch	Yes	4	Phar.D.	Yes	....	Phar.D.
L. Saalbach	Yes	6	Phr.D.	Yes	....	Phr.B.
Purdue University (Ind.)						
W. F. Gidley	No	..[38]	Phar.D.	Yes	....	B.S. (Phar.)
C. O. Lee	No	6 or 7	Phar.D.	Yes	....	B.S. (Phar.)
C. B. Jordan	..[12]	7	Ph.D.	Yes	....	B.S. (Phar.)
Medical College of South Carolina						
W. G. Harper	Yes	4	Phar.D.	Yes[39]	....	Phar.D.
W. H. Zeigler	Yes	4	Phar.D.	Yes	....	Phar.D.
St. Louis College of Pharmacy (Mo.)						
H. M. Whepley	No	..	.....	Yes	....	Ph.C.
State College of Agriculture of S. D.						
E. R. Serles	Yes	..[40]	Phar.D.	Yes[8]	....	B.Sc. (Phar.)
University of Tennessee						
R. L. Crowe	Yes	4	Phar.D.	No	Ph.C.	Phar.D.
Tulane University (La.)						
O. W. Bethea	Yes	4	Phar.D.	Yes	....	Phar.D.
G. S. Brown	Yes	4	Phar.D.	Yes	....	Phar.D.
A. B. Dinwiddie	No	..	Phar.D.	Yes	....	Phar.D.
Union University (N. Y.)						
H. C. Muldoon[41]	Yes	6	Phar.D.	Yes	....	B.S. (Phar.)
Medical College of Virginia						
W. G. Crockett	Yes[12]	..	Ph.D.	Yes	....	B.S. (Phar.)
P. F. Fackenthall	Yes[12]	..	Ph.D.	Yes	....	B.S. (Phar.)
M. Phipps	Yes[12]	..	Ph.D.	Yes	....	B.S. (Phar.)
R. W. Miller	Yes[12]	..	Ph.D.	Yes	....	B.S. (Phar.)
W. F. Rudd	Yes[12]	..	Ph.D.	Yes	....	B.S. (Phar.)

[35] Also Ph.C. for 3-year course.
[36] Provided the curriculum is thorough.
[37] To avoid confusion with Ph.D.
[38] If given, not less than 6, preferably 7 years.
[39] With a few changes it is sufficient.
[40] At least 2 years beyond an M.S. degree.
[41] Now at Valparaiso.

State College of Washington						
P. H. Dirstine	Yes	7	Phar.D.	Yes	....[35]	B.S.
University of Washington						
C. W. Johnson	Yes	..[42]	Ph.D.	No	....[43]	B.S. (Phar.)
A. W. Linton[44]	Yes	..[45]	Ph.D. (Phar.)	No	....[35]	B.S. (Phar.)
E. V. Lynn	Yes	7	Ph.D. (Phar.)	Yes	....	B.S. (Phar.)
Western Reserve (Ohio)						
E. Spease	No[46]	6 or 7[47]	D.Sc. or Ph.D.	..	....	B.S.
E. E. Stanford	No[48]	7	Ph.D.	Yes	....	B.S. (Phar.)
University of West Virginia						
G. A. Bergy	Yes	6	P.D.	No	B.S. Pharm.	B.S. (Phar.)
University of Wisconsin						
R. H. Denniston	No	..	.....	Yes	....	B.S. (Phar.)
E. Kremers	Yes[12]	7	Ph.D.	No	....	B.S. (Phar.)
W. O. Richtmann	Yes	7	Ph.D. (Pharm.)	No	B.S. Pharm.	B.S. (Phar.)

It is to be observed that prevailing opinion in teaching circles favors the award of the doctor's degree after the completion of six to seven years of study. It is to be noticed further that the abbreviation preferred by a majority of those answering is Phar.D.; that sixty-five of the ninety-six teachers are content with the Ph.G. degree for a two-year course; and that the B.S. as a four-year degree satisfies fifty-eight of those replying.

A large number of teachers added as a footnote that high school graduation should be a prerequisite to any degree work in pharmacy.

CHAPEL HILL, N. C.
APRIL 25, 1922.

TEAM-WORK.*

Primitive man was rather a rough character if we can judge from the savage races still to be found in out-of-the-way places in the world to-day. He lived and toiled alone; he fought for what he had to eat and wear. The chase supplied him

[42] Same requirement as Ph.D. in leading universities. Ph.D. (Major in Pharmacy).

[43] Anything less than a bachelor's degree should be called a certificate.

[44] Deceased.

[45] Depending upon time required for thesis work. Approximately 3 years beyond B.S.

[46] D.Sc. or Ph.D. should be offered instead.

[47] From 2 to 3 years beyond that of the A.B. or B.S. degree.

[48] Minimum of 3 years. Post-graduate study to include an achievement of discovery of recognized scientific value.

* A talk to the New England Branch of the American Pharmaceutical Association on May 3, 1922, by Charles W. Pearson, Lecturer on Commercial Pharmacy, at the Massachusetts College of Pharmacy.

with everything he needed except where fishing gave him a chance to vary his diet. In his fights with his fellow-man he sometimes acquired things which he did not know how to make himself. Eventually the idea came to him that others whom he could not hope to slay might have something which he could use. With the slow beginnings of trade between the primitive savages we have the first necessity for adjusting one's self to one's neighbors.

The result of these contacts, begun at first for the purpose of securing something which the other did not know how to produce, has been the development of civilization. The first necessity for dealing with the alien except as an enemy came through trade, and, as larger units of life grew up, man became more civilized the more he learned to use the work of others. In order to succeed in trade it was found necessary to guarantee the safety of those who were engaged in it, and from this sprang up the first recognition of the rights of others to whom one was not related by blood. It is from this recognition of the rights of others that men learned the lesson that results can best be achieved by coöperation.

Much is said in favor of liberty, but the liberty of the primitive man to do whatever he chose was far from a blessing. Just as soon as he came in contact with others he could not exercise that liberty without infringing on their rights. They in turn felt the limitation on their liberty, but war to protect that liberty meant the extinction of the other and all chance to profit by the other's labor. One cannot have complete liberty to do what one likes and enjoy the rewards which come from working together.

In the long run it is the man who can get along with others, the man who can do his part, and adjust himself to those with whom he comes in contact, who reaps the big rewards. It is not so much a question of brilliancy, as one of adjustment. To-day in business it is the man who gets on with his customer, his competitors and his employees who will win the big prizes and accomplish the most good in the world. As modern civilization goes, we must accommodate ourselves to the other fellow. We must take into account his likes and dislikes, his aspirations and his peculiarities if we would succeed. By so doing we may hope to achieve more for ourselves and more for the world at large.

The birds can show us something in this respect. Many of them are hunted because they taste good to us, others are hunted because our fruits and crops taste good to them. They face a difficult problem of survival. Game laws have been passed to protect many species. Children are taught not to injure them. Yet one of these species against whom every farmer fights is actually thriving. Some of those which are perishing, like the eagle, are swift of flight, some like the woodpecker have protective coloring, some like the robin are esteemed for their song, and some like the bluebird are prized for their appearance. Yet the bird which flourishes has none of these advantages. The crow is not swift of flight, nor well camouflaged by nature; it is homely and unadmired, and its song is a by-word for lack of music. Yet despite the fact that no one desires to protect the crow, and a large number are actively in the field to destroy him, you can find him along any country road to-day. Man has not even been able to drive him into the wilderness with the other wild birds. He still thrives openly in the sight of man.

How is it, then, that the crow survives so amazingly? Watch the farmer boy with gun in hand sneaking upon a flock of crows, feeding in the cornfield. He gets

almost within range, when from a neighboring tree top comes the warning, "Caw! Caw! Caw!" Then a single crow flies away in the opposite direction, while those on the ground rise and follow the sentinel. The whole maneuver is accomplished without confusion and not one comes within gun shot of the boy.

You seldom see a crow alone. If they are feeding in a field, they take turns on sentry duty, but they are working together. If you see a crow alone, it is probable that he is looking over the territory in the interests of the others. There is always team-work among them. Suppose an enemy invades their territory, for example a hawk. Individually they could do little, but that is not the way they work. They gather in a company and fuss and scold over the hawk until he takes wing. Then they fly above him in a great crowd, all the time making the air noisy with their cries until the hawk can stand it no longer and retreats into the upper air where the crows cannot follow him. Thus by team-work they get rid of their enemies and maintain their own safety. This is the answer to the survival of the crows. It is not the brilliant individual gifts, but the ability to work together for a common cause which makes them prosper.

The value of team-work is evident in other fields. How many times an all-star baseball aggregation falls before the one in which a skilful manager has instilled team-work. Nearly every year the championship goes not to the team with the best individual players, but to the one which has so subordinated individual play and individual notoriety to team-work that they won the games while the other fellows were fattening their averages. Team dissensions have wrecked more than one pennant possibility in the big leagues. When we turn to football, what is the object of the successful coach? Almost from the opening of the season, he is more intent on welding the individuals into a unit than on increasing their individual capacities. From this has come the use of the phrase team-work as applied to coöperation.

While I have been recounting these cases of coöperation, doubtless some of you have been mentally applying them to your own experience. Now let us check up and see how the druggist may exercise team-work. When you consider it I think you will be surprised at how many points this touches your daily experience.

In the first place we find team-work in so simple a thing as the selection of merchandise for your store. One of the principles which has controlled the ever-widening field of the modern drug store, is the addition of related lines. The presence of hospital supplies has led to the addition of rubber goods not needed for sickness. The start once made in any line can be broadened. The soda fountain, originally for drinks only, has sometimes added luncheonette features. The principle of association is seen in the changes that have taken place in the merchandise handled. Those druggists who have added phonographs to their array of side-lines are now looking forward to selling radio outfits. Each new line suggests another to go with it. The principle of team-work applies to the selection of merchandise.

Then again we have the common method of increasing sales. A man buys a toothbrush and you call his attention to the toothpastes which you carry. He buys a fountain pen and you sell him ink. You seek to increase your sales by teaming up one sale with another. Here again we have the principle of working together.

When you come to window display you have another occasion for team-work. You should link up your counter display with your window. When the customer has been drawn into your store by that attractive display of perfumes, she should be reminded of it inside the store, instead of having her thoughts diverted to hair-nets and candy. An inside exhibit to tie up with that in the window is, therefore, very desirable. One druggist who had a window exhibit of cameras, had a special display of cameras moved to the front of the store just for that week to take advantage of a special drive. This was team-work. The window and the counter worked together.

Some stores, sad to say, lack team-work. In one of the larger stores, a customer asked for three cakes of a certain brand of soap, and on receiving his change expressed surprise that he had been charged the regular price. "I thought you were having a special sale. You advertised three bars for 20 cents to-day." The clerk said he knew nothing about it. The store manager overheard the conversation and, after adjusting the matter with the customer, called the clerk's attention to the advertisement which was posted not far from his station. Probably this could not happen in a small store, but if you do advertise, see that your clerks work in coöperation with it. Improve your team-work in this particular.

Here is another thing that may happen in small stores. When buying a necktie or something of that sort in a haberdashery, haven't you had occasion to call the clerk out to see the display in his own window? I think many of you have had to educate the clerk in what his own store displayed for sale. Did you ever think that possibly the same thing might happen in your store? Here is another opportunity for team-work. Get your salesforce in league with your window display if you want the best results. Otherwise you are in danger of losing much of the effectiveness of your windows.

How is it with your clerks? Do they work for you or with you? I have been impressed whenever I have read about the experiences of men who have succeeded that they referred to their employees as the men who worked with them, not as the men who worked for them. Here is an important relation on which much of the success of the business is based. The employee who works with you is the one who puts the proper team-work into the job. Hence you need to ask yourself if you are getting proper coöperation from your clerks. If you feel that you are not, or are doubtful on that point, here is a place for these principles of team-work which we are considering. See to it that your employee feels that he works with you, not for you. If he speaks of the store as "our store" you are on the right track. The man who is proud of the store he works in makes the efficient clerk.

But the opportunities for team-work are not limited to the inside of your store. There is a broader field for it outside. What of your competitor? Here is the hard thing for most of us. You have a nice business built up as the result of years of careful planning and hard work. Just as business gets brisk enough for you to cherish the idea that your hardships are over, another store is opened in your neighborhood by a man who has seen the trade which has developed there and covets a share in it. The natural human tendency is to curse him and treat him as an enemy. To do this, in most cases, does you more harm than good. If you let your customers see that you are bitter, you will lose many of them to the newcomer. If you cut prices and try to drive him from the neighborhood, you stand to lose far more money than he, for you will sell far more goods at a loss than he

will. It is much better to get together and display a little team-work. Realize that another man has the same right to pick the most favorable location for starting business that you have. Then greet him in a way which will disarm hostility, and with a little care you should be able to hold far more of your trade and develop more new business than otherwise. It is one of the peculiar things about business, that the opening of a new retail store in the same neighborhood does not divide the previous business, but frequently brings additional trade through attracting more purchasers.

But the chief thought I wish to leave with you this evening is that of coöperation with other druggists in such associations as this which has brought us together to-night. It is through these associations that we have the opportunity to put team-work to its greatest use. There are many things which we cannot do individually, which we may hope to accomplish if we are united in an association. The friendly feeling which comes from common interests and frequent gathering should lead to mutual work for the interests of all. One sometimes hears druggists in a city discussing a partial closing for Sunday, but immediately some one tells the same old story, "we should like to do it, but so-and-so wouldn't agree, so we can't do it." This is poor team-work. We must practice and preach better coöperation than this, if we are to get the best results.

One of the chief difficulties with which the pharmacist contends is the fact that there are numerous laws which control and affect his business. The very multiplicity of them is bad enough, but the worst feature is their uncertainty. In this state, for instance, I understand that there is no clear interpretation of the law on Jamaica ginger. I am told that in one city a druggist was arrested and fined for selling, as he supposed, in accordance with the state law, yet because of a change in the justice who that day occupied the local court, the decision was rendered against him. The justice who usually sat in that court had always ruled in the opposite way when such cases came before him. Another druggist was fined twenty dollars for selling in accordance with instructions received from one federal agent on the complaint of another. There is only one way to settle such difficulties. When a decision is rendered by the highest tribunal of the state or nation the law is determined. In the absence of such a decision the pharmacist is at the mercy of the particular judge who happens to try the case. The judge has nothing to guide him in interpreting the law but his own personal bias. Until the law has been interpreted by the Supreme Court, he is free to make any decision that he feels agrees with the law. Now no individual pharmacist can afford to carry his case to the Supreme Court, because of the expense involved. It would be necessary to employ a first-class lawyer to get adequate consideration of the case. The only proper way to handle such a matter is through an association. By proper coöperation between the druggists who are interested a test case could be paid for, and then the individual pharmacist would no longer be faced with uncertainty as to what constituted the law on that particular question.

From time to time freak bills are introduced into state legislatures which would seriously hamper the pharmacist. Associations do the work of preventing the passage of injurious laws and should be heartily supported by all. Such team-work as this is valuable to the profession. It is to be hoped that all pharmacists will come to realize the value of team work, and unite to work for the common good.

PHARMACEUTICAL FORMULAS

PROPOSED FOR "UNOFFICIAL FORMULAS, A. PH. A."

The formulas heretofore published will be found in Volume I, JOURNAL A. PH. A., pp. 169, 366, 505, 637, 760 and 1307; Volume V, pp. 309, 422, 529, 631, 748, 862, 991 (see also p. 1129), 1126, 1265 and 1397; Volume VI, pp. 79, 194, 298, 393, 486, 563, 643, 729 and 823. See also Volume X, pp. 292, 382, 468, 534, 628.

For list of committee members and committees see April issue, 1921, p. 292. Suggestions for formulas, and comments on those published are invited. They may be sent to a member of the Committee or to Chairman J. Leon Lascoff, 1223 Lexington Ave., New York, N. Y.

PHOTOGRAPHIC FORMULAS.

By I. A. Becker.

FORMULAS FOR REDUCERS.

No. 707.

FARMER'S REDUCER.

(For removing an equal amount of silver from all parts of a negative.)

Sodium Thiosulphate	1 ounce av.
Water	4 fluid ounces

After the sodium thiosulphate has been dissolved add just enough potassium ferricyanide to make the solution a lemon-yellow color.

The negative must be thoroughly washed after it has been reduced.

From *Kodakery*, November 1919, p. 25, Eastman Kodak Co., Research Dept.)

No. 708.

PERMANGANATE REDUCER.

(For removing a little more silver from the dense than from the thin parts of a negative.)

Solution A

Potassium Permanganate	24 grains
Water	1 fluid ounce

Solution B

Sulphuric Acid C. P.	24 minims
Water	1 fluid ounce

Take 1 fluidrachm A, 2 fluidrachms B, and water 8 fluid ounces. Mix well.

When the negative has been sufficiently reduced immerse it in a fresh acid fixing bath and leave it in the bath for a few minutes, until after all the color which the reducer may have imparted to the negative has disappeared, then wash the negative thoroughly.

(From *Kodakery*, November 1919, p. 25, Eastman Kodak Co., Research Dept.)

No. 709.

PERSULPHATE REDUCER.

(For removing much more silver from the dense than from the thin parts of a negative.)

Ammonium Persulphate	1/8 ounce av.
Sulphuric Acid C. P.	20 minims
Water	4 fluid ounces

The speed with which this reducer acts increases as reduction proceeds.

The appearance of milkiness, when a negative is being reduced, indicates that reduction is speeding up. At this stage the negative must be closely watched, and it should be taken out of the reducer just *before* enough silver has been removed, quickly rinsed and *immediately* immersed in a fresh acid fixing bath, wherein it should be left for a few minutes, and then thoroughly washed.

(From *Kodakery*, November 1919, p. 25, Eastman Kodak Co., Research Dept.)

No. 710.

PROPORTIONAL REDUCER.

(For removing silver from a negative in proportion to its density; for instance, if 25% is removed from the highlights, 25% will be removed from the halftones, and 25% from the shadows.)

Solution A

Potassium Permanganate	2 grains
10% Solution Sulphuric Acid C. P.	1/4 fluid ounce
Water	16 fluid ounces

Solution B

Ammonium Persulphate	1 ounce av.
Water	32 fluid ounces

Take 1 part A and 3 parts B, this will usually reduce the negative sufficiently in 3 minutes' time. After the negative has been reduced it

must be rinsed and then given a 5-minute immersion in a 1% solution of potassium metabisulphate, or sodium bisulphite, after which it must be thoroughly washed.

(From *Kodakery*, November 1919, p. 25, Eastman Kodak Co., Research Dept.)

No. 711.

MERCURIC IODIDE INTENSIFIER.

(One Solution.)

Mercuric Bichloride	200 grains
Potassium Iodide— (sufficient to just redissolve the precipitate first formed)	
Distilled Water.....	40 fluid ounces
Sodium Hypophosphite, a large pea crystal.	

This solution can be used repeatedly until exhausted.

No. 712.

DEVELOPER.

(Prevents excessive contrast in harshly lit subjects.)

Metol.....	48 grains
Hydrochinone.....	240 grains
Sodium Sulphite, dry	960 grains
Water.....	40 fluid ounces

Keeps well.

For use take Stock Solution.....	1 fluid ounce
Water.....	7 fluid ounces

No. 713.

BLACKENING BRASS.

Copper Nitrate.....	200 grains
Silver Nitrate.....	200 grains
Water.....	1 fluid ounce

Mix the solutions; clean article well; dip it in the solution for a moment; withdraw it; and heat it strongly.

No. 714.

BLACKENING BRASS.

(For lens mounts, and with articles when heat must not be applied.)

Pyrogallic Acid.....	1 Gm.
Acetone.....	10 cc
Solution Ferric Chloride.....	2 cc
Methylated Spirit of Wine to make....	20 cc

Apply several times; allow to dry before applying the next coating until the desired dark color is obtained.

RESOLUTIONS ON DRUG STANDARDIZATION BY AMERICAN DRUG MANUFACTURERS' ASSOCIATION.

The following resolutions were adopted:

Resolved, That the following recommendations of the Scientific Section of the American Drug Manufacturers' Association be adopted by the association in annual convention assembled and transmitted by the secretary to the Revision Committee of the United States Pharmacopoeia:

(1) That a limit of 1 percent of free salicylic acid in a tablet of acetylsalicylic acid one year old be established.

(2) The adoption of a physiological assay only for aconite and its preparations.

(3) That a standard for ipecac and its fluidextract of 1.50 grams per 100 cc be established and the menstruum for fluidextract specified by the United States Pharmacopoeia eighth revision be adopted.

(4) That strophanthin from the official drug strophanthus Kombè as the standard for digitalis and its preparations be adopted.

(5) That the physiological assay for fluidextract cannabis be dropped.

(6) That the process for fluidextract ergot include defatting the drug.

(7) That the report of the Scientific Section of this association with reference to essential oils adding a limit of ash for rose water and eliminating benzaldehyde be submitted to the Revision Committee of the United States Pharmacopoeia.

(8) That the texts adopted by the Scientific Section of this association for the following drugs be submitted to the Revision Committee of the United States Pharmacopoeia: Spartiene sulphate, cephaeline in emetine, procaine, picrotoxin, hyoscyamine sulphate, morphine meconate.

Secretary W. J. Woodruff resigned on account of illness, and appropriate resolutions were adopted. Charles M. Woodruff was elected counsel emeritus of the association.

THE DEPARTMENT OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

[EDITOR'S NOTE: The tentative program of the 1922 meeting of the Conference is presented herewith. Attention is called to the dates and the hour schedule of the sessions and all representatives are urged to be present at the opening session. In order not to interfere with the other activities of Convention Week, the time schedule must be strictly adhered to. Considerable effort has been made to prepare a profitable program. However, in order to make it worth while there must be hearty coöperation and active participation in the work of each session on the part of the entire Conference membership. If, in the working out of the convention program, it should be found advisable to change the time of the Conference sessions, notice will be given to all in due time.

At the New Orleans meeting, President Dinwiddie of Tulane University gave a most helpful address before the Conference. It is full of thought for those interested in making pharmacy of greater service, and it deserves a greater publicity than can be given in the Conference Proceedings. It is therefore reproduced in part in the present issue of the JOURNAL.

The Chairman of the Executive Committee wishes to announce that, in the recent vote taken by mail, the College of Pharmacy of Valparaiso, Indiana, was elected to Conference membership.

RUFUS A. LYMAN,
Chairman Executive Committee and Conference Editor.]

To the members of the American Conference of Pharmaceutical Faculties:

The twenty-third annual meeting of the Conference will be held in Cleveland, Ohio, on August 14 and 15, 1922, at the headquarters hotel for the 1922 Convention of the American Pharmaceutical Association.

Credentials should be sent to the Chairman of the Executive Committee in advance of the meeting.

PROGRAM.

FIRST SESSION.

Monday, August 14, at 2.00 P.M.

1—Roll Call
2—President's Address
3—Report of Secretary-Treasurer
4—Appointment of Nominating Committee
5—Reports of Standing Committees:
  a—Executive Committee
  b—Pharmaceutical Syllabus Committee
  c—Committee on Higher Educational Standards—D. B. R. Johnson, *Chairman*
  d—Committee on Faculties—C. E. Caspari, *Chairman*
  e—Committee on Curriculum and Teaching Methods—W. J. Teeters, *Chairman*
  f—Committee on Activities of Students and Alumni—Miss Zada M. Cooper, *Chairman*
  g—Committee on Uniform College Bulletins—J. A. Koch, *Chairman*
  h—Committee on Relations of Pharmacy Schools and Other Professional Schools—L. S. Blake, *Chairman*
  i—Committee on Relations of the Colleges with the Boards of Pharmacy, Including the Question of the Establishment of Two Classes of Pharmacies—Jacob Diner, *Chairman*
  j—Committee on Examination Questions—G. C. Diekman, *Chairman*
  k—Committee on Research—Albert Schneider, *Chairman*
Reports of Special Committees:
  a—Committee to Prepare and Distribute Information on Prerequisite Legislation—W. B. Day, *Chairman*

b—Committee to Urge that the Carnegie Foundation Investigate the Pharmacy Schools of the United States — W. F. Rudd, *Chairman.*

SECOND SESSION.

Monday, August 14, at 6.00 P.M.

Dinner given by the Conference in honor of Dr. H. H. Rusby, distinguished teacher, scientist, and traveler.

Following the dinner, Dr. Rusby will relate his personal experiences concerning his recent South American trip.

At 8.00 P.M., Dr. Caswell A. Mayo of Cincinnati will, at the request of the Executive Committee, give an illustrated lecture on physical plants of the schools holding membership in the American Conference of Pharmaceutical Faculties. He will also touch upon the Pharmaceutical activities being carried on by the United States Government.

THIRD SESSION.

Tuesday, August 15, at 9.00 A.M.

Report of Committee on President's Address
An address by an eminent educator
Papers on Teaching of Dispensing by W. G. Crockett, School of Pharmacy, Medical College of Virginia, and W. J. Teeters, University of Iowa
Papers on Pharmaceutical Libraries and their Uses—by H. V. Arny, College of Pharmacy of the City of New York, and Edward Kremers, University of Wisconsin
Miscellaneous Business
Election of Officers
Executive Session
Adjournment

A joint meeting of the Conference with the Section on Education and Legislation of the American Association of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will be held during the week of the conventions, as announced in the detailed program issued by the American Pharmaceutical Association.

Respectfully submitted,

CLAIR A. DYE, *President,*
RUFUS A. LYMAN, *Chairman Executive Committee,*
THEODORE J. BRADLEY, *Secretary-Treasurer.*

STANDARDS IN EDUCATION.*

BY DR. A. B. DINWIDDIE.[1]

Mr. President and Members of the American Conference of Pharmaceutical Faculties:

As I expected to be in New York at this time, I declined the first invitation to speak at this Conference, but am very much pleased to be with you after all. I have been interested in the educational standards of Tulane University for fifteen years or more—for its college and its schools of medicine, engineering, law, dentistry and pharmacy, and can say that they all have different points of view. The standard of each is different. The standards of schools of medicine are controlled by the American Medical Association, in part by legislation and in a large measure by the survey of the Carnegie Foundation. To be a doctor does not necessarily mean that one must understand medical education. The business of a dean of a medical school is a profession of itself for he must know medical education as well as medicine.

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* Parts of an address delivered before the American Conference of Pharmaceutical Faculties at the 1921 meeting at New Orleans, La.

[1] President Tulane University, New Orleans.

If you turn to engineering you will find that engineering standards are in a most chaotic condition and that certain of the factors which determine the standards of medical education are lacking. You do not find state legislation; you do not find a survey by such an influential organization as the Carnegie Foundation; you do not find a full agreement on the part of college associations. You find engineering schools ranging all the way from the college of agriculture and mechanics in the small state to the Massachusetts Institute of Technology or the Engineering School of Cornell University. The result is that if a man is a graduate of an engineering school you cannot identify his training as you can identify that of a man who is a graduate of an accepted medical school. The question of standards for the latter is determined either through an organization of all such colleges or schools, or is determined through the American Medical Association, which suggests the standards to the schools, which they then adopt. The two influences in many cases are simultaneous. I do not believe in absolutely rigid courses. The graduate of the Tulane Medical School is as different from the graduate of the Johns Hopkins Medical School as it is possible for two medical men to be, for the aims are different. The men at Johns Hopkins are trained specially and those at Tulane are trained generally.

For dentistry, no standard has as yet been fixed. There is hardly a satisfactory standard (I speak as a layman) towards which all dental schools are working. There are two agencies working on the dental schools—the National Association of Dental Faculties and the Association of Dental Schools. A dental school in a university is in a different situation from a dental school which is independent; and the same is true with pharmacy. The standards of independent pharmacy schools are determined by the Conference of Faculties. It is difficult to say just what is going to be the form of education in schools of pharmacy. Some years ago, I submitted to the Carnegie Foundation, with which we were affiliated, the question whether it was necessary for an institution which had adopted a Carnegie standard of fifteen units to have that standard adopted in all its schools. The Carnegie Foundation declined then, and probably still declines, to make any ruling on pharmacy at all, on the ground that standards in pharmacy have not yet reached a definite form. The Carnegie Foundation will never support an arbitrary ruling. The dental schools have asked the Carnegie Foundation to make a survey. Similar requests have also been made in reference to pharmacy. What will be the result? When the Carnegie Foundation produced its effective work in reference to the survey of medical schools, the American Medical Association was backing it up, and was putting into effect very stringent regulations at a rapid rate. But when the Carnegie Foundation has no standards for education in pharmacy, what would be the point from which it would inspect a school? That is the question that occurs to me. If a survey of the schools of pharmacy is made through the Carnegie Foundation, they would undoubtedly take the recommendations of your body, when they are in final shape, or else study all of the schools of pharmacy separately, try to find their common factor and present a careful analysis of the whole subject. I believe in the survey, as by that means we shall find where we are "at." It might be well to study the question of possible aid. Carnegie gave a great deal of aid to the building up by medical schools of the standard which developed through the survey. As President of Tulane University, I think there

can be no university devoted to the welfare of the public which does not coöperate in all departments. We cannot build up pharmacy without medicine. I am a strong believer in the dignity of professional men, and believe in making pharmacy a profession and not a business. There is an effort to put ethics into business, through advertising clubs and things of that kind. Can we make business a profession? There are a hundred colleges of commerce, representing thousands of dollars, which are attempting to do this. If we are to distinguish between pharmacy as a business and pharmacy as a profession, we must adopt standards which, in the first place, give a sufficient amount of scientific training to cover the whole subject and to more than cover the subject. You must have the proper entrance condition, but I do not think you can afford to have anything less than a high school education. Letters are being sent to eighth-grade students by business colleges asking "Why study more? Go into business and make some money." Do not deny the completion of high school work to one who has attended high school for two or three years, because some day he will be sorry for it, and you will be partly responsible. In the third place, it is a dangerous thing to take on a boy for a new branch of his mental or technical development until he has accomplished something. If you take him out after two years of high school work, the moral effect is bad on the boy. Your responsibility is very great in taking a boy who has not yet finished his high school work. Dentistry is considering more than high school work. Law requires at least one year and sometimes two years of higher work, and unless you want a widened gap, pharmacy should be brought up. There are three things to be considered: what the goal is, what the steps are, and the period of time in which the work should be done.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter. To maintain its activity and representation each branch should see that at least three of its meetings during the year are reported in the JOURNAL.

DETROIT.

The retiring secretary, Edward K. Field, of the Detroit Branch of American Pharmaceutical Association, reports that 24 members have been added through the coöperation of the Membership Committee of the Detroit Branch. The treasurer reported a balance of $101.75. The officers for the ensuing year are: *President*, Charles H. Stocking, Secretary, Department of Pharmacy, University of Michigan; *Vice-President*, Crosby B. Washburn, Detroit, Mich.; *Secretary*, Grover C. Chostner, Instructor, Department of Pharmacy, Cass Technical High School, Detroit, Mich.; *Treasurer*, F. F. Ingram, Jr., Detroit, Mich.; *Chairman of Program Committee*, E. R. Crandall, Instructor, Department of Pharmacy, Cass Technical High School, Detroit, Mich.

CONFERENCE IN CLEVELAND OF THE OFFICERS OF THE LOCAL BRANCHES.

Chairman Ivor Griffith, of the Committee on Local Branches, will call a Conference of the officers of the Local Branches A. Ph. A., to convene in Cleveland. The purpose is to discuss programs for the ensuing year, matters of mutual interest, and the promotion of the work carried on by Local Branches.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Conducted by H. V. Arny, Reporter on the Progress of Pharmacy, Chairman of the Committee on Research.

On these pages, each month, will be found a list of articles on pharmaceutical research; the list appearing a certain month will record articles appearing in American journals of the preceding month and articles appearing in foreign journals will be recorded as quickly as possible after the journals reach the Reporter.

All articles appearing in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK which will be issued as soon after the end of the year represented as editing and printing conditions permit. Those desiring abstracts immediately can obtain same for a fee of one dollar each by communicating with H. V. Arny, 115 West 68th St., New York, and arrangements can also be made for securing photographic reproductions of entire articles at moderate prices when such are desired.

PHARMACOPOEIAL REVISION.

Stamm, D. M.
Proposed U. S. P. changes
Pract. Drug., 40 (June 1922), 23

APPARATUS AND MANIPULATIONS.

Debucquet, L.
Preparing and preserving colorless solutions of physostigmine salicylate
J. pharm. chim., 25 (May 1, 1922), 373

Rudolph, O.
Concentrating solutions by evaporation
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Pract. Drug., 40 (June 1922), 18

Jones, E. R.
Nail polishers and cuticle removers
Bull. Pharm., 36 (June 1922), 246

Lundin, P. E.
Mucilage of salep
Pharm. Ztg., 67 (May 10, 1922), 397

GENERAL BOTANY AND BACTERIOLOGY.

Dobrowolski, J. M.
Drug plant cultivation in Poland
Rocz. Farm.; through *Pharm. Ztg.*, 67 (May 6, 1922), 386

Lieser, Jaquet and Pintenet
Staining tubercular bacilli
Compt. rend. soc. Biol.; through *Schweiz. Apoth. Ztg.*, 60 (May 25, 1922), 269

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Pharm. Monats.; through *Pharm. Ztg.*, 67 (May 6, 1922), 388

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Clin. Med.; through *Am. Drug.*, 70 (June 1922), 15

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Relation between chemical structure and antiseptic action
J. Soc. Chem. Ind., 41 (May 5, 1922), 134T

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Z. angew. Chem.; through *Pharm. Ztg.*, 67 (May 31, 1922), 457

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Vegriéres and Ferreyrolles
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VEGETABLE AND ANIMAL MATERIA MEDICA.

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COMMITTEE REPORTS

REPORT OF THE COMMITTEE ON PATENTS AND TRADE-MARKS.*

BY F. E. STEWART, CHAIRMAN.

Your committee is gratified to note that the industrial institutions related to the materia medica are at last waking up to the importance of patent and trade-marks reform. The same is true in regard to various institutions of scientific, semi-scientific and educational character. It is to be hoped that this interest will continue until the United States Patent Office becomes

* Presented at New Orleans meeting A. Ph. A., 1921. Referred for publication by House of Delegates; see page 791, October number JOUR. A. PH. A.

what the founders of the American Republic meant it should be, that is, a great bureau of archives having as its object "promotion of progress in science and useful arts."

The object of the Patent law, and the Patent Office as means for attaining that object, is well summarized in the following statement taken from Terril in his treatise on patent laws:

> The theory upon which these laws rest is that it is to the interest of the community that persons should be induced to devote their time, energies, and resources to original investigation for the furtherance of science, the arts, and manufactures. This was recognized from the earliest periods which can pretend to be described as civilized. It is to the advantage of the whole community that authors and inventors should be rewarded, and no measure of reward can be conceived more just and equitable and bearing a closer relation to the benefit conferred by the particular individual than to grant him the sole right to his writing or discovery for a limited period of time.

As examples of the interest now being taken in the U. S. Patent Office the following report of the Commissioners of Patents in regard to the needs of that important branch of government service, and the action of the National Research Council in appointing a committee to investigate the Patent Office and the patent system, are interesting and significant.

REPORT OF THE COMMISSIONER OF PATENTS IN REGARD TO THE NEEDS OF THE U. S. PATENT OFFICE.

The following statistics regarding the business of the Patent Office were presented by Commissioner of Patents, R. F. Whitehead, in his report of the fiscal year ending June 30, 1920. He said:

> The gains over the previous fiscal year in applications for mechanical patents, registration of trade-marks, and in total applications were, respectively, 19,193, 6,149, and 27,283 in numbers and thirty percent, seventy-two percent, and thirty-six percent in proportionate increases. The gain in actual numbers far exceeded any previous increases of business in any one fiscal year, and this gain is larger than the total receipts of any calendar year in the history of the Office up to and including the year 1881.
>
> The patents granted and trade-marks, labels, prints registered during the year 1920 were as follows: Letters patent, 37,316; design patents, 2,102; reissue patents, 227; trade-marks, 6,984; labels, 622; prints, 158; a total of 47,409.
>
> The total receipts of money increased twenty-four percent and the net deficit for the fiscal year 1919 of $65,228.13 was turned into a net surplus of $179,135.96, making a relative net increase of $244,135.09 for the year.
>
> Any person conversant with the facts in relation to patent and trade-mark law administration cannot help being impressed with the significance of these figures. The question naturally arises whether under an interpretation and application of the patent and trade-mark laws given in this report, the Patent Office would be called upon to conduct this important department of the Government in such an expensive way.

NATIONAL RESEARCH COUNCIL APPOINTS A COMMITTEE TO INVESTIGATE THE UNITED STATES PATENT OFFICE AND THE PATENT SYSTEM.

Names of Committee: In 1917, the Commissioner of Patents, with the approval of the Secretary of the Interior, requested the National Research Council to appoint a committee to investigate the Patent Office and patent system, with a view to increasing its effectiveness and to consider what might be done to make the Patent Office more of a national institution and more vitally useful to the industrial life of the country. In due time, this special committee was appointed and it is worth bearing in mind that every one of them were men of large experience and also of national reputation in their special lines of activity. These were Dr. Wm. F. Durand, Dr. L. H. Baekeland and M. I. Pupin, scientists and inventors; Drs. R. A. Millikan and S. W. Stratton, scientists; Dr. Reid Hunt, physician and member of the Council on Pharmacy and Chemistry of the American Medical Association, and Professor of Pharmacology, Harvard University; and Messrs. F. P. Fish, Thomas Ewing and E. J. Prindle, patent lawyers. Mr. Ewing at one time served as Commissioner of Patents.

THE ASPIRIN CASE.

Much interest still centers in the "Aspirin Case." In the suit between the Bayer Company and the United Drug Company the former (plaintiffs) endeavored to prove that the word "aspirin" was used by them as a trade-mark to distinguish their brand of acetylsalicylic acid from other

brands of the same product, the product itself being known to the medical profession and the drug trade under its chemical name; the latter (defendants) claiming that the Bayer Company in their advertising used the name Aspirin as one of the names of the product itself—in fact, so used it in their advertising to the general public as to give the impression that aspirin was the most important if not the only proper name for purchaser to use in buying it—in other words, "aspirin" as advertised was presented to the public as a noun of the language, not the name of a brand. As it is an established principle of law that the name of an article of commerce cannot at one and the same time perform the office of a name for the product itself, and the name of a brand of the article, it is evident that the contention of the defendant had a good chance of being sustained. For the principle has been sustained again and again by U. S. Supreme Court decisions: it is the *way* a word is used that determines whether or not it is a trade-mark. It must be so used as to point out *manufacturer of the brand*, to distinguish it from other brands of the same article, not as the name of the article, or as synonym for the same.

Unfortunately for all concerned, Judge Sanborn, who first presided when the case was tried, died, without rendering a decision, and Judge Hand, whose function it afterward became to decide the case, endeavored to distinguish between ways in which the Bayer Company used the word. He denied the United Drug Company the use of the word "aspirin" in so far as its manufacturing and wholesale operations go, but decided that the United Drug Company as retailers had the right to use the word aspirin as the name of the product when selling to the public at large. As stated by the *Bulletin of Pharmacy* (June 1921): "If the United Drug Company chooses to put up acetylsalicylic acid tablets in bottles of fifty for sale over the counter they can label such bottles 'Aspirin.' But if these same bottles are sold to other druggists or to wholesalers the company must wrap around the package another label identifying the product by its chemical name and must bill it under the chemical name, not as 'Aspirin.' Judge Hand's opinion* * *is a peculiar document, inasmuch as both parties to the suit seem to be losers." Paul Bakewell, an attorney, has written an opinion for the Monsanto Chemical Works, of St. Louis, Mo., in which he takes exception to many parts of the learned Court's decision. See *Pharmaceutical Era*, July 1921.

Several of these points may be briefly mentioned: First, the Court was influenced in the decision by the charge of unfair competition made by the plaintiff. The defendant, United Drug Company, marked its aspirin "genuine aspirin," and the court said that this "gave color to the supposition that its product had been made by the plaintiff," because the plaintiff, as owner of the recently expired patent, had been practically the sole manufacturer.

Second, referring to the brand of aspirin made by the Monsanto Chemical Works, of St. Louis, Mo., Mr. Bakewell, in his opinion of its status, said in his letter to said corporation: "However this element of unfair trade is altogether absent from your use of the name of 'aspirin.' You make and sell, under your own name, the identical drug, aspirin, which became public property from and after Feb. 27, 1907, on which last named date the Hoffman U. S. patent No. 644,047 expired, and after the Bayer Company and its predecessor in the business had enjoyed the exclusive monopoly under that patent for seventeen years and had made millions of dollars out of the enjoyment of that monopoly during that period; and you call your drug 'aspirin' because that is the name of that drug—the name by which it became known in pharmacy long before the U. S. patent for the same expired."

Third, Mr. Bakewell calls attention to the fact that the U. S. cancelled the registration of the word "aspirin" as a trade-mark. This fact is important in relation to the recent Act passed by Congress and known as "An Act to give effect to certain provisions of the convention for the protection of trade-marks and commercial names, made and signed in the city of Buenos Aires, in the Argentine Republic, August 20, 1910, and for the other purposes." It is important because it clearly brings out certain limitations in regard to the use of trade-marks and trade names, namely, that in spite of registration as a trade-mark, the registrant, by forcing his registered name into the common language as a noun, or one of the names of the thing advertised, by his own act, or negligence, loses it as a trade-mark. The registered word must be *used* as a trade-mark, namely, to point out the brand of the article and distinguish it from other brands of the same article. Unless the registered word is accompanied by a suitable name for describing the article by physicians in prescribing, and pharmacists in ordering supplies, the registered word is sure of adoption as the generic term. In that case the dictionaries will adopt the currently used name

as an appellative, as they have a perfect right to do. The name *aspirin* is an instance of this, as the following definition, taken from Webster's Collegiate Dictionary (third edition) will show:

"Aspirin, *n. Pharm.* A white crystalline compound of acetyl and salicylic acid used as a drug for the salicylic acid liberated from it in the intestines."

The fact that the word "Aspirin" was cancelled as a trade-mark brings to mind the provision in the law which gives the right to cancel trade-mark registration, and what that fact means in relation to the trade-mark problem.

Referring to this cancellation, Mr. Bakewell says: "Judge Hand in his opinion (p. 3) refers to the fact that on May 2, 1899, the predecessor of the Bayer Company registered the name 'aspirin' in the Patent Office, which registration (p. 5) was cancelled by the Patent Office in November 1918, under Sec. 13 of the Act of Congress of Feb. 20, 1905 (as amended), which statute provides for cancellation of trade-marks improperly or unlawfully registered in the U. S. Patent Office. But the learned judge does not refer to the following important proposition and facts, pointed out in my opinion to you of August 15, 1917, presumably because they were not in the record before him, or were not sufficiently urged in the briefs or oral arguments: Unless the one claiming under a registered trade-mark has the right at common law to the thing claimed as a trade-mark, he gets no rights by virtue of registration in the Patent Office."

"Registration in the U. S. Patent Office can in no way validate a trade-mark, when on settled principles of law, there can be no valid trade-mark in the name or thing registered."

Mr. Bakewell's commentary contains many citations from judicial decisions in support of his statements to which the readers of this report are respectful referred.

Fourth, Mr. Bakewell continues: "In the face of these decisions, what boots it that the predecessor of the Bayer Company did obtain a certificate of registration for the name 'aspirin' in the U. S. Patent Office May 2, 1899, as Judge Hand states in his opinion? No doubt Judge Hand did not know (at least his opinion does not refer to the fact) that, as pointed out in my said opinion to you of August 15, 1917, the *Patent Office was deceived in the matter of issuing that certificate.*" (Italics mine, F. E. S.) Mr. Bakewell goes on to explain how the deception, claimed by him to have occurred, was accomplished.

DESCRIPTIVE NAMES CANNOT BE TRADE-MARKS.

All of this supports the contention of your committee persistently and consistently maintained, year after year, that a descriptive name cannot be a trade-mark, and that even if the Patent Office permitted its registration as such, no property rights would be created thereby. It is, in fact, an axiom of law that a descriptive name cannot be a trade-mark. The name "salt" cannot be a trade-mark on salt, or "sugar" on sugar, or "aspirin" on aspirin. Names cannot be copyrighted. Circular No. 19, issued by the Librarian of Congress, clearly states that fact.

The inventing or coining of a name does not make it the property of the inventor. The act of inventing does not create property in the thing invented, neither does the inventor possess a natural right to exclude others from using it. The function of a trade-mark is to indicate the origin or ownership of the brand, not the ownership of the product itself. As already stated, certain manufacturers, patent lawyers, and people engaged in the advertising business, are endeavoring "by hook or by crook" to obtain legislation of such character as to give commercial control over coined or invented words, so that they may obtain thereby commercial control over the products marketed under such coined names. They are endeavoring to obtain international monopolies of advertised products by means of a "convention" in which the various countries are to be represented.

It also goes to show that, in case of chemical substances and medicines, or, in fact, in case of any article of commerce that cannot be readily identified by its physical appearance and other characteristics, the name of the substance itself, or of the compound if it be such, must be plainly marked on the label, so that the public may have an opportunity to distinguish in purchasing between the different brands on the market. By so doing the manufacturer provides a way for using a trade-mark, or trade name with some assurance that he can defend its use from would-be infringers. Take, for example, the words "Eagle Brand" on the label of condensed milk. It clearly indicates that no monopoly in the sale of condensed milk is claimed by the manufacturer. And it is quite possible that if the Bayer Company had labeled its make of the product, "Acetyl-Salicylic Acid—Aspirin Brand," they would have been sustained in the use of the word "Aspirin" in that connection after the expiration of their patent on "Acetyl-Salicylic Acid."

CONCLUSION.

As stated at the beginning of this report, the object of the patent law is to promote progress in science and useful arts. The United States Constitution points out the way to secure this object. Clause 8, of Sec. VIII, Art. I, upon which the patent law is founded, reads: "To promote progress in science and useful arts, by securing, for limited times, to authors and inventors the exclusive right to their respective writings and discoveries."

The proprietary medicine system is the antithesis of this. It is a system for securing unlimited rights in the sale of patented and unpatented products by registering as trade-marks names intended for use as the current names of the products themselves, and thus to defeat the object of the patent law. Where, in the Constitution, is there a clause justifying such an interpretation and application of the principle underlying this so-called proprietary system. The principle is one of unlimited monopoly of inventions and alleged inventions by the ownership of their names. The fact that a patent is a *grant* by the Government representing the public at large giving to inventors of new and useful inventions 17 years' monopoly of their sales, clearly shows that the so-called proprietary system is an invasion of public rights.

The patent law, in its relations to materia medica science, and the arts of pharmacy and pharmaco-therapy, is intended to secure coördination and coöperation between the educational and industrial institutions related to this department of medical science and practice.

The term "products" refers to medicinal drugs, chemicals and preparations of the same. The term "educational institutions" refers to the professional societies, professional press, medical and pharmaceutical schools and colleges, hospitals and their clinics, dispensaries, and the medical and pharmaceutical professions at large in so far as they are engaged in research work and the publication of results for the benefit of science.

Is it the desire of the proprietary medicine trade to coöperate with these educational institutions for the furtherance of medical science and the arts of pharmacy and pharmaco-therapy? If so, the educational institutions ought for the sake of humanity throw open their doors to the proprietary trade and bid them welcome. If this is their desire they should be reminded that the meaning of the word coöperation in this connection includes the donation of their inventions and discoveries to science, and that coöperation between educational and industrial institutions is impossible under a system of commercial monopoly and the introduction of materia medica products by misleading advertising. Is it not true that, on the contrary, the proprietary medicine trade desires to exploit these educational institutions for commercial gain? If so, that means, in other words, the proprietary trade desires to convert the educational institutions into an advertising bureau for exploiting the sick and the teaching of error.

It has frequently been pointed out that coöperation between the educational and industrial institutions was characteristic of Germany before the great world war, and that the marvelous development and prosperity of that nation was largely due to that coöperation. How was such coöperation secured? Two potent factors account for it. Monopolies of medicines, foods and chemical substances were not permitted, and laws were passed and enforced against advertising in a misleading manner. This permitted the educational institutions of Germany to coöperate with the industrial institutions of that nation, in building up the sciences of chemistry and materia medica by coöperative research work in which the laboratories of the universities and commercial houses coöperated for that purpose.

Your committee has repeatedly pointed out the superiority of the German method of applying the patent system to the chemical and pharmaco-chemical industries over the system of the United States. Attention has been called to the fact that the proper interpretation and application of the U. S. patent law by the Patent Office and the Courts would accomplish the same purpose in America. If it were not so, then our patent law should be so amended as to make it suitable for the purpose intended.

Finally, it was the intent of the "Fathers of the U. S. Constitution," in providing for a patent law, that inventors should be rewarded, "and no measure of reward can be conceived more just and equitable and bearing a closer relation to the benefit conferred by the particular individual than to grant him the sole right to his discovery for a limited period of time."

Are medical, pharmacal, and pharmaco-chemical inventors being properly rewarded under the present interpretation and application of the U. S. patent law? This is a question of too much importance for detailed discussion in this report. But there is one point that should be brought

to your attention, and that is, progress in medical science, and in the arts of pharmacy, pharmaceutical chemistry and pharmaco-therapy, requires the fixing of responsibility for research work upon the individual or individuals who do the work. It is necessary that their names shall be known, and their protocols, duly signed, be presented to the professional societies and professional press for impartial discussion and verification. One measure of reward is "scientific credit," and the importance of scientific credit in this connection must be apparent to any person who will take the time to consider the far-reaching consequences which must result by refusing to give it.

REPORT OF COMMITTEE ON MODEL FOR A MODERN PHARMACY LAW.*

Your Committee held its last session in Philadelphia, during the month of December 1920. It there decided upon some corrections and changes in the tentative draft of a Model Law as heretofore submitted, and commissioned some of the members separately to re-draft a few of the Sections for subsequent consideration and final decision, regarding which there has been considerable correspondence within the Committee during the year. The draft of a Model Modern Pharmacy Law, as herewith submitted, is in keeping with the final decision of the Committee at its last session, but we ask that it be specially noted, that the final draft was not completed in time to first permit the separate, final consideration of the Committee members, in order that minor changes and corrections, as found necessary by the respective members, might first be made. It is therefore requested that the Association at this time receive this report and that publication be withheld until later to enable the several Committee members, after careful study, to determine whether any further corrections or minor changes be necessary with authority, on a vote of the Committee, to adopt such corrections or changes prior to publication. Assuming that this will be agreeable, we also recommend that this report be not taken up for final action until the next annual meeting of the Association in order that its publication will permit careful consideration prior to final discussion and final action at the next meeting.

We would separately call attention to the fact that two very important changes in tentative draft, heretofore submitted, have been made by order of a majority at the last session of the Committee. The tentative draft provided a partial formula disclosure for proprietary medicines and preparations, and a majority of the Committee for several reasons opposed this requirement and on that account it has been omitted. The tentative draft provided for a new method of naming Poisons and Potent Drugs, which upon final consideration was not approved by a majority of the Committee, and in its place the Schedule Enumeration, as used in a number of state laws, was adopted with an expression from the Committee, that this Association, and other interested associations and individuals, give separate and more exhaustive study to the subject of Poisons and their proper naming.

Before making a very brief epitome of the more important provisions which are contained in the draft herewith submitted, we believe it proper to say a few words about the work of the Committee, how it came to be taken up, and who coöperated therein: This work was commenced under the auspices of the Section on Education and Legislation after the meeting in Detroit, in 1914. The officers of the Section, acting under authority given them at that time, enlisted the coöperation of the several state associations and state boards of pharmacy, who with very few exceptions appointed representatives as Conference Committee members. A list of the Conference members, showing representation from forty-seven states and the District of Columbia, is attached hereto. There were two or three changes in the personnel of state representation, and these have been mentioned in earlier reports. After the Conference was created its members were solicited to make suggestions for desirable changes in their respective state pharmacy laws, and to offer new provisions to be contained in a Modern Law. There was a most hearty response and coöperation. The suggestions for change and improvement coming from all sections of the country, made it possible to compile an outline for a draft which appeared to be generally acceptable. This outline embodying the best thought from all sections, was then submitted to the Conference members for further suggestions and criticisms, and, wherever possible, for consideration and discussion by the several state associations and state boards. Added suggestions were made and where they appeared to be generally acceptable, they were adopted.

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* Presented at New Orleans meeting A. Ph. A., 1921.

The outline for a draft and for the accepted changes were discussed and approved by many state associations and state boards. The work was continued under the auspices of the Section on Education and Legislation and with the coöperation of the Conference representatives until 1916, when it had been brought to a point where agreement regarding the more important features was quite general. At the 1916 convention the collective thought of pharmacists from all sections had been gathered sufficiently to enable a Committee to complete the work and, at the request of the Section on Education and Legislation, the Association decided that such a Committee be appointed by the President to finish the task. This Committee first consisted of Messrs. Wm. C. Anderson, H. V. Arny, James H. Beal, Chas. H. Huhn and Frank H. Freericks, and made its first report in 1917, and a supplementary report in 1918. Thereafter the pressure of other Committee work caused some change in its membership; since early in 1919, the Committee has been as it is now constituted.

Our draft of a pharmacy law as now submitted includes provisions to govern the practice of pharmacy and the sale of Poisons and Potent Drugs. In its preparation the Conference, and subsequently the Committee, have not been controlled by the thought of legislative expediency. It has been the aim to consider the present-day need for minimum requirements, which *ought* to govern the practice of pharmacy. An effort has been made to adhere to constitutional limitations. It has been in mind, that in most states it is deemed best to ask for only a few legislative changes at one time and the draft can be readily used to single out a few provisions which can be offered for legislative enactment from time to time. We do not claim that every feature or detail of the draft expresses the opinion of all who have taken part in the work, but in every case objections to any feature which were not sustained, and non-approval of features which have been submitted and not adopted, come from isolated parts, and were an exception to the general desire. For ready understanding we offer an epitome of some of the most important provisions in the draft submitted:

1. It is required that the majority of state board members be graduates in pharmacy.

2. A Drug Commissioner is provided for who is to act under the supervision of the Board of Pharmacy, and who is charged with the enforcement of all laws pertaining to pharmacy.

3. The compounding and manufacture of drugs and medicines and their sale and distribution at retail is limited to persons who must be licensed by the Board of Pharmacy, either as pharmacists, physicians, etc., or drug dealers. Physicians, etc., who are not licensed by the State Board of Pharmacy may supply only the emergency need of their patients, and when they are licensed by the Board of Pharmacy they may supply medicines only to their *patients*.

4. The requirements for experience to become licensed as a pharmacist are somewhat increased and improved upon. The college prerequisite is adopted. College graduates lacking the required practical experience may take their examination in theoretical subjects immediately after graduation. Apprentices must register with the Board and they must be high school graduates.

5. Provisions are made to define a "Recognized College" on the basis of hours of study, equipment and professorial staff.

6. Reciprocal registration is provided for. Coöperation among State Boards of Pharmacy is placed upon a legal basis.

7. Every place from which drugs and medicines are sold or dispensed must annually be registered with the Board of Pharmacy.

8. Physicians, dentists and veterinarians who dispense poisons must either label them as such, or must keep a record and use proper marks of identification for the containers in which they are dispensed.

There are many other new provisions of distinct importance, but it will hardly serve to separately enumerate them and it will require a close study of the entire draft for complete understanding.

Respectfully submitted,

WM. C. ANDERSON,
J. H. BEAL,
GEO. M. BERINGER,
F. E. STEWART,
F. H. FREERICKS, *Chairman.*

CONFERENCE MEMBERS APPOINTED BY PRESIDENTS OF STATE ASSOCIATIONS AND BOARDS OF PHARMACY.

Representing State Associations.

Alabama, L. I. Scarborough; Arizona, Thomas E. Thorpe; Arkansas, A. L. Morgan; California, D. R. Rees; Colorado, A. W. Clark; Connecticut, S. M. Aller; Delaware, Albert Dougherty; District of Columbia, W. S. Richardson; Florida, W. D. Jones; Georgia, Herman Shuptrine; Idaho, Roscoe W. Smith; Illinois, Prof. C. M. Snow; Indiana, A. F. Sala; Iowa, George D. Newcombe; Kansas, C. C. Reed; Kentucky, Robert J. Frick; Louisiana, Joseph W. Peyton; Maryland, James E. Hancock; Massachusetts, Ernest O. Engstrom; Michigan, John H. Webster; Minnesota, Charles H. Huhn; Mississippi, A. S. Coody; Missouri, Prof. Francis Hemm; Montana, J. A. Riedel; Nebraska, Charles R. Sherman; Nevado, H. J. Duncan; New Hampshire, Edwin C. Bean; New Jersey, George M. Beringer; New Mexico, G. S. Moore; New York, Dr. William C. Anderson; North Carolina, L. W. McKesson; North Dakota, W. S. Parker; Ohio, Waldo M. Bowman; Oklahoma, A. W. Woodmancy; Pennsylvania, S. C. Henry; Rhode Island, James O'Hare; South Carolina, F. M. Ellerbe; South Dakota, D. F. Jones; Tennessee, Edw. V. Sheely; Texas, Sam P. Harbin; Utah, James L. Franken; Vermont, W. R. Warner; Virginia, Walter G. Williams; Washington, Prof. Charles W. Johnson; West Virginia, Walter E. Dittmeyer; Wisconsin, Prof. Edw. Kremers.

Representing State Boards of Pharmacy

Alabama, W. E. Bingham; Arizona, T. L. McCutchen; Arkansas, Frank Schlachleiter; Colorado, Frank E. Mortensen; Connecticut, John A. Leverty; Delaware, Reuben M. Kaufman; Georgia, Charles D. Jordan; Idaho, T. M. Starrh; Illinois, Frederick T. Provost; Indiana, Jerome J. Kenne; Iowa, David E. Hadden; Kansas, W. S. Henrion; Kentucky, Addison Dimmitt; Louisiana, E. H. Walsdorf; Maine, Frank T. Crane; Maryland, J. Fuller Frames; Massachusetts, Albert J. Brunelle; Michigan, Leonard A. Seltzer; Minnesota, R. L. Morland; Mississippi, T. O. Slaughter; Missouri, Charles Gietner; Montana, W. R. Montgomery; Nevada, Robert L. Prouty; New Hampshire, Herbert E. Rice; New Jersey, Lewis W. Brown; New Mexico, B. G. Dyne; New York, Warren L. Bradt; North Carolina, W. W. Horne; North Dakota, H. L. Haussamen; Ohio, Edward Voss, Jr.; Oklahoma, J. C. Burton; Oregon, J. Lee Brown; Pennsylvania, Lucius L. Walton; Rhode Island, Howard A. Pearce; South Carolina, H. E. Heinitsh; South Dakota, F. W. Halbkat; Tennessee, O. J. Nance; Texas, W. H. Cousins; Utah, John Culley; Vermont, Wilfred Root; Virginia, W. L. Lyle; Washington, D. B. Garrison; West Virginia, Alfred Walker; Wisconsin, Edward Williams; Wyoming, C. B. Gunnell.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY AND TO CONTROL AND REGULATE THE MANUFACTURE, SALE AND DISTRIBUTION OF DRUGS, CHEMICALS, POISONS AND POTENT DRUGS.

Be it enacted by the General Assembly of———————————

SECTION 1.—Definitions: (*a*) the term "pharmacist" when not otherwise limited means a person licensed by the State Board of Pharmacy, to prepare, compound and dispense physicians' prescriptions, drugs, medicines and poisons; (*b*) the term "pharmacy" when not otherwise limited means a place registered by the State Board of Pharmacy in which drugs, chemicals, medicines, prescriptions and poisons are compounded, dispensed and retailed; (*c*) the term "drug dealer" means one who conducts a fixed place of business and who is registered by the Board of Pharmacy to distribute and sell drugs, chemicals, medicines and poisons in original packages only, as prepared by or under the supervision of a licensed pharmacist; (*d*) "chemicals" where not otherwise limited means the chemical materials of medicine; (*e*) "drugs" where not otherwise limited means all substances used as medicines or in the preparation of medicines; (*f*) "medicines" where not otherwise limited means drugs or chemicals, or preparation thereof, in suitable form for the prevention, relief and cure of disease, when used either internally or externally by man or for animal; (*g*) "Pharmacopoeia" when not otherwise limited means the latest edition of the Pharmacopoeia of the United States of America; (*h*) "National Formulary" means the latest edition of that work as published by the "American Pharmaceutical Association;" (*i*) "Board" or "Board of Pharmacy" wherever used in this Act, unless otherwise specifically indicated, shall mean the State Board of Pharmacy of this state.

SECTION 2: There shall exist and be maintained within the state a State Board of Pharmacy with duties and powers as hereinafter defined and provided. The State Board of Pharmacy shall consist[1] of five (5) members, and the now existing State Board of Pharmacy heretofore appointed shall continue in office and act as the State Board of Pharmacy with all the duties and powers as herein provided until the terms of its present members, respectively, expire, the vacancies as they annually occur to be filled in keeping with the requirements of this Act. Hereafter in making appointments to the State Board of Pharmacy the appointees shall have been licensed Pharmacists under this or some former law of the state, for a period of at least five (5) years, and at the time of their appointment a majority of them shall be engaged in retail pharmacy. At least a majority of the members of the State Board[2] of Pharmacy shall be graduates of a college or school of pharmacy, and if the now existing State Board of Pharmacy is not so constituted the first occurring vacancies of the Board shall be filled with appointees meeting such qualification, except in the case of re-appointment of present members, and such qualification for at least a majority of the Board shall thereafter be maintained. Members of the State Board of Pharmacy to be appointed under this Act, shall be appointed by the Governor and shall serve for a term of five (5) years, or until their successors are appointed, and have duly qualified. Vacancies occurring in the Board other than by expiration of term shall be filled for the unexpired term only. The members of the Board shall be paid ten ($10.00) dollars per diem, and their necessary expenses while actually engaged in the performance of the duties of the Board. Annually, the State Pharmaceutical Association may from among its membership nominate five (5) candidates for the next occurring vacancy on the Board of Pharmacy, who shall meet the requirements as herein provided, and from among the nominees, when regularly submitted and certified by the president and secretary of the State Association, or from others having the necessary qualification, the Governor shall make his appointment for vacancies occurring in the Board of Pharmacy. Appointees to the Board of Pharmacy shall within thirty (30) days after their appointment take and subscribe an oath or affirmation before a properly qualified officer, that they will faithfully and impartially perform the duties of their office, which oath or affirmation shall be filed with the Secretary of State.

SECTION 3: The State Board of Pharmacy shall organize by electing a president, vice-president, secretary and treasurer, all of whom shall be elected annually, and all but the secretary shall be members of the Board. The officers of the existing Board shall continue to so act until the term for which they have been elected shall expire. The Board shall have power to make rules and regulations for the proper performance of its duties, and the duties of its officers and employees and to carry out the provisions of this Act. The president of the Board shall preside at all of its meetings and in his absence or inability to preside the vice-president shall so act. The treasurer at stated periods as ordered by the Board shall receive and receipt for all moneys turned over to him by the secretary which are then to be paid by him into the State Treasury on or before the ——— day of every month, to the credit of a fund for the use of the State Board of Pharmacy, and he shall file with the Auditor of State a detailed verified statement of such receipts and payments. The compensation and expense of the members, officers and employees of the Board including the State Drug Commissioner shall be paid out of this fund, and out of such necessary appropriations toward said fund as shall be provided by the state. All disbursements on account of the Board shall be made upon requisition signed by its president and secretary and the warrant of the Auditor of State. The treasurer of the State Board of Pharmacy shall receive a compensation of $——— per annum, and shall be required to give a bond to the state in the sum of $——— with surities approved by the Board, conditioned upon the faithful discharge of his duties. The secretary of the State Board of Pharmacy shall be its executive officer, and shall be in charge of its offices. He shall make, keep and be in charge of all the records and record books required to be

[1] This number may be increased when deemed to be expedient.

[2] Where all members are desired to be engaged in retail pharmacy it can be so provided.

kept by the Board. He shall receive all fees to be collected under this Act and also collect, receive and receipt for all fines imposed under this Act in prosecutions brought by the State Board of Pharmacy, or under its direction, and at regular intervals, as ordered by the Board, shall pay the same over to the treasurer of the Board and take the treasurer's receipt therefor. He shall keep a register of all who under this Act are required to be licensed, and also of all places of business required to be registered hereunder, shall attend to all correspondence of the Board and shall perform such other special secretarial duties which the Board may charge him to perform, in keeping with the office of secretary. The officers, including the secretary of the State Board of Pharmacy, shall be empowered to administer oaths in connection with the duties of the Board. The secretary shall receive a salary to be fixed by the Board and all his necessary expenses, incurred while in the performance of his official duties. He shall give a bond to the state in the sum of $——— otherwise similar to the bond required from the treasurer. The bonds required to be given by the treasurer and by the secretary and by employees, under regulation of the Board, shall be deposited with the Secretary of State, and kept in his office. The books and registers of the Board as made and kept by the secretary or under his supervision, subject to the direction of the Board, shall be *prima facie* evidence of the matter therein recorded, in any court of law. The Board shall as an Examining Board meet at least four times each year in the city of ————————, or at such other place within the state as it may designate at any regular session.

SECTION 4: There is hereby created the office of a State Drug Commissioner, who under the control and supervision of the State Board of Pharmacy, and in its name is directly charged with the enforcement of all laws coming within the jurisdiction of the Board. The State Drug Commissioner shall be appointed by the State Board of Pharmacy for a term of ——— years at a salary of $———— per annum. The State Drug Commissioner for at least five (5) years prior to his appointment shall have been licensed to practice pharmacy, and he shall be a graduate of a college or school of pharmacy. Vacancies in the office of the State Drug Commissioner shall be filled by the Board for the unexpired term. The State Drug Commissioner shall employ all necessary chemists, agents and clerical help for the proper conduct of his office, as may be from time to time determined by the State Board of Pharmacy, and all of his appointments shall be passed upon and approved or disapproved by the State Board of Pharmacy at its next regular session after the appointments are made. The State Drug Commissioner shall report upon his official duties to the State Board of Pharmacy at all its regular sessions, and at such other times as it may direct.

SECTION 5: It shall be the duty of the State Board of Pharmacy through the State Drug Commissioner and through its officers and employees appointed under its supervision for that purpose, to enforce all laws of the state, now or hereafter enacted, which pertain to the practice of pharmacy, the manufacture, production, sale or distribution of drugs, chemicals and poisons, and to their standard of strength and purity. All fines and fees imposed and recovered under this Act shall be collected by and paid to the secretary of the State Board of Pharmacy, to be by him turned over to the treasurer of the Board, by whom the same are to be paid into the State Treasury. As an Examining Board it shall examine all persons in the art and science of pharmacy and its allied branches, who meet the necessary qualification as herein provided and who make application for a license as Pharmacist, Assistant Pharmacist, Medical, Dental or Veterinary Dispenser, and Drug Dealer.

SECTION 6: The compounding and manufacture of drugs and medicines and their sale and distribution at retail or to consumers, when of potent or poisonous character as defined in this Act, shall be limited exclusively to persons who are licensed for that purpose under the provisions of this Act, or under the supervision of such, provided that all persons now licensed within this state as Pharmacists or Assistant Pharmacists shall have all the rights which are granted to Pharmacists and Assistant Pharmacists, under this Act, when complying with the requirements thereof as hereinafter set out; and, provided further, that nothing contained in this Act shall be construed to prevent the personal administration of drugs and medicines carried or kept for emergencies, by licensed dentists, physicians and veterinarians, in order to supply the immediate need of their patients.

For the purpose of this Act, there shall be and are hereby made provisions for the licensing of Pharmacists, Assistant Pharmacists, Medical, Dental and Veterinary Dispensers, and Drug Dealers, each having the right hereinafter provided, and being subject to the limitations and restrictions as respectively made.

(*a*) A Pharmacist shall have the right to conduct a pharmacy for the compounding of medicines upon physicians' prescriptions, and for the manufacture, sale and distribution of drugs, medicines and poisons.

(*b*) An Assistant Pharmacist shall have the right to do all things that may be done by a Pharmacist, when in a pharmacy or place of business conducted under the supervision of a Pharmacist.

(*c*) Medical, Dental and Veterinary Dispensers, who must also be by this state licensed physicians, dentists or veterinarians, shall have the right only to compound and dispense medicines which they prescribe for persons or animals under their medical treatment, and such compounding and dispensing shall be strictly incident to the practice of medicine, dentistry or veterinary medicines.

(*d*) Drug Dealers, when conducting fixed places of business at least———— miles distant from a pharmacy, shall have the right to distribute and sell potent drugs and medicines, and poisons as compounded and prepared under the supervision of Pharmacists licensed in this or other states, when properly labeled under the name of a licensed Pharmacist, known wholesale dealer, or manufacturer of drugs and chemicals.

SECTION 7: (*a*) Every applicant for a license as a Registered Assistant Pharmacist shall be not less than eighteen (18) years of age, and shall have at least three (3) years of practical experience in a pharmacy where physicians' prescriptions are compounded, and shall have successfully completed not less than one (1) year of instruction in a recognized college or school of pharmacy, for which credit shall be given as practical experience covering the time of college course pursued. Every applicant shall furnish proof of preliminary education equal to graduation from a high school of this state.

(*b*) Every applicant for a license as a Registered Pharmacist shall be not less than twenty-one (21) years of age, and shall be a graduate of a recognized college or school of pharmacy; shall have at least two (2) years of practical experience as a registered Assistant Pharmacist in a pharmacy where physicians' prescriptions are compounded, provided not more than one (1) of said two (2) years may be credited for a course successfully completed at a recognized college or school of pharmacy; shall furnish proof of preliminary general education equal to graduation from a high school of this state. It is hereby provided that a graduate of a recognized college or school of pharmacy lacking the required practical experience shall be permitted to take an examination on theoretical subjects at any regular examination of applicants and at any time after graduation, a record of the credits secured being made and kept by the State Board of Pharmacy, the practical examination in such case to be taken at the end of the required five (5) year period.

(*c*) Every applicant for registration as a licensed Medical, Dental or Veterinary Dispenser shall give proof of registration under the laws of the state, as a physician, dentist or veterinarian.

(*d*) Every applicant for registration as a Drug Dealer shall be not less than twenty-one (21) years of age, and shall give proof of having attained at least a common school education, entitling to entrance of a high school in the state.

SECTION 8: Every applicant for registration as licensed Pharmacist and Assistant Pharmacist shall, to prove respective requisite knowledge, be examined to a proper varying degree in the subjects of chemistry, botany, materia medica, toxicology, and the theory and practice of pharmacy. Every applicant for a license as Medical, Dental or Veterinary Dispenser shall be examined for fitness to compound and dispense drugs and medicines to patients. Every applicant for a license as Drug Dealer shall be suitably examined for fitness to distribute and sell drugs and medicines; provided, however, that all licensed physicians, dentists and veterinarians of this state, who, when this Act takes effect, have been accustomed to compound and dispense medicines which they prescribe for their patients, may on application to the Board of Pharmacy within ninety (90) days from that date, upon

affidavit, setting out such fact, become licensed without examination, as such Medical, Dental or Veterinary Dispenser; and Drug Dealers who prior to, and at the time that this Act takes effect, have been engaged as such within the state, may within ninety (90) days from that date become licensed as such without examination, upon application to the Board of Pharmacy, giving satisfactory proof.

SECTION 9: Every person who hereafter desires to engage in pharmacy, with a view of becoming licensed as Assistant Pharmacist and as Pharmacist, shall, upon entering employment in a pharmacy register as an Apprentice with the State Board of Pharmacy, and for every such person the requisite practical experience shall be determined from the date of registration. A fee of fifty (50) cents shall accompany an application for registration as Apprentice, and a certificate shall be issued by the Board to such applicant. A person who before or after this Act takes effect may have served part of his apprenticeship in some other state not requiring such registration shall give proof of such service satisfactory to the Board. Persons who immediately prior to the time when this Act becomes effective have been employed in a retail pharmacy, with a view of becoming licensed as an Assistant Pharmacist or as a Pharmacist, shall for that purpose be given credit for the time so spent, in becoming registered as Apprentice.

SECTION 10: It shall be unlawful for any person to impersonate an applicant before the State Board of Pharmacy applying for registration or license under the provisions of this Act. Any person violating this Section shall be guilty of a misdemeanor, and upon conviction shall pay a fine of not more than one hundred ($100.00) dollars, or be imprisoned for not more than six (6) months, or either, or both, in the discretion of the court.

SECTION 11: Persons desiring to enter a college or school of pharmacy shall give proof of the required general education prior to admittance thereto. The necessary proof of an entrance examination shall consist either of a certificate issued by the proper school authorities, or in successfully passing an examination before an Entrance Examiner, appointed by the Board for that purpose, at suitable compensation, to be allowed by the Board. The Entrance Examiner, under the authority of the Board, shall issue to such persons, properly qualifying and applying therefor, a certificate of preliminary education.

SECTION 12: The Board of Pharmacy shall make and promulgate the requirements for recognition of colleges and schools of pharmacy, subject to changes as may be deemed necessary by it. The requirements shall include provisions for a course of instruction, equipment and professorial staff.

SECTION 13: Every applicant for examination as Pharmacist shall pay an examination fee of ten ($10.00) dollars; every applicant for examination as Assistant Pharmacist, Medical, Dental or Veterinary Dispenser, or as Drug Dealer, shall pay an examination fee of five ($5.00) dollars. Certificates of registration and license shall be issued to Pharmacists on payment of a fee of five ($5.00) dollars, and to Assistant Pharmacists, Medical, Dental or Veterinary Dispensers, and Drug Dealers, on payment of a fee of three ($3.00) dollars. Certificates of Preliminary Education shall be issued at a fee of three ($3.00) dollars. Every applicant for reciprocal registration as Pharmacist, in addition to the fee covering cost of investigation, shall pay a fee of $———— and Assistant Pharmacist a fee of $————. All fees shall be paid to the State Board of Pharmacy, and by it covered into the State Treasury, to the credit of the State Board of Pharmacy.

SECTION 14: The State Board of Pharmacy may in its discretion grant certificates of registration as licensed Pharmacist or Assistant Pharmacist, to persons who furnish proof that they have been licensed as such, by examination in some other state, and that they are of good moral character, provided, that such other state in its examinations require the same general degree of fitness as is required by examination in this state, and that the applicant qualifies in all other respects as is required for licensing by examination in this state, excepting that persons who have become licensed by examination in other states, prior to the time that this Act takes effect, and who have continuously, thereafter, been engaged in pharmacy, shall be required to meet only the requirements which existed in this state at the time when they became licensed in such other state, and, provided also, that such other state or states in like manner grant reciprocal licensing to Pharmacists and Assistant Pharmacists of this state. Applicants for reciprocal licensing in

this state shall defray all necessary expense for making an investigation of their character, general reputation and pharmaceutical standing, in the state where they resided, such expense not to exceed the sum of ten ($10.00) dollars.

SECTION 15: The State Board of Pharmacy, in order to be informed and to determine the status of Boards of Pharmacy of other states desiring reciprocal licensing and in order also to be advised regarding the progress of pharmacy throughout the country, shall annually select one of its members to meet at the expense of the Board, with like representatives from other State Boards of Pharmacy. At such meetings, when arranged, there shall be discussed the degree of fitness which is required by the several State Boards of Pharmacy for granting licenses. Such representatives of the several State Boards of Pharmacy may adopt rules and regulations which shall guide the several Boards in the matter of reciprocal licensing, but abidance therewith shall be optional and at the discretion of the State Board of Pharmacy. The State Board of Pharmacy through its representatives may with like representatives from other State Boards of Pharmacy join in creating and maintaining an association of representatives of the several State Boards of Pharmacy, to be engaged in the general advancement of pharmacy and in the keeping of records pertaining to the reciprocal licensing of Pharmacists, and at its discretion the Board may give to such association information which it possesses relative to such aims. The State Board of Pharmacy at an expense not to exceed one hundred ($100.00) dollars, per annum, may subscribe for and secure the service of an association engaged in the compilation of pharmaceutical information, knowledge and progress, specially adapted to secure efficiency in the work of the Board.

SECTION 16: The license of any Pharmacist, Assistant Pharmacist, Medical, Dental or Veterinary Dispenser or Drug Dealer, may be suspended or revoked by the Board of Pharmacy, when the license is proved to the Board to have been obtained by fraudulent means, or when the licentiate has been convicted of felony or is found by the Board to be guilty of gross immorality, or to be addicted to the liquor or drug habit to such a degree as to render him unfit to compound, sell or distribute drugs and medicines. Suspension or revocation of a certificate shall be only after due notice and hearing and for the purpose of such hearing the Board or any member thereof or its secretary is authorized to examine witnesses under oath and to take oaths or affirmations, and to reduce the testimony given in any such case to writing. Within thirty (30) days after the suspension or revocation of a license the licentiate may take an appeal to any court of record of the state, of competent jurisdiction, and pending such appeal the decision of the Board shall be suspended until the court renders judgment which shall be final in the case, and if the decision of the Board is not sustained, the licentiate shall be reinstated.

SECTION 17: There shall be kept in every Pharmacy and in every Medical, Dental or Veterinary Dispensary, a copy of the latest revision of the United States Pharmacopoeia, and the latest revision of the National Formulary, and if homeopathic remedies are compounded and dispensed, a copy of the latest revision of the Homeopathic Pharmacopoeia of the United States, which books must be open to the inspection of the Board of Pharmacy, the Drug Commissioner and their properly authorized agents and employees. Any person violating this Section shall, upon conviction, be fined the sum of ten ($10.00) dollars and the cost of prosecution.

SECTION 18: All certificates as Pharmacist and Assistant Pharmacist, Medical, Dental or Veterinary Dispenser, and Drug Dealer, shall at all times be conspicuously displayed in the place of business or dispensary where the licentiate is engaged as such. Any licentiate violating this Section, upon conviction, shall be fined the sum of ten ($10.00) dollars and the cost of prosecution.

SECTION 19: Every place in or from which drugs, chemicals, medicines, prescriptions or poisons are compounded, dispensed or sold at retail shall (except as otherwise provided by law) be a pharmacy or drug store in charge of and under the supervision of a licensed Pharmacist; a dispensary conducted for the need of patients only by a licensed Medical, Dental or Veterinary Dispenser; or a store conducted by and under the supervision of a licensed Drug Dealer. Every such place shall be annually registered in the month of January

with the Board of Pharmacy, on application forms provided for that purpose by the Board, on request, and the Board shall thereupon issue a suitable certificate of registration which shall be conspicuously displayed in the respective place of business. Applications for registration as a pharmacy or drug store shall include information regarding the names of all pharmacists, assistant pharmacists and registered apprentices who are employed therein. Only places in charge of a licensed Pharmacist may use the title "Pharmacy," "Pharmacist," "Apothecary" or "Drug Store," and each must be under the separate management of a licensed Pharmacist, who shall not engage to manage or supervise more than one such place, but nothing contained in this Section shall prevent a person from owning and conducting more than one pharmacy, provided each be under the separate supervision of a licensed Pharmacist. For the registration of every place herein required to be registered there shall be paid an annual registration fee of one ($1.00) dollar by the person desiring its registration. Any person failing to register his place of business as herein required, failing to have in charge of each pharmacy a licensed Pharmacist, who does not manage or supervise more than one pharmacy, or who otherwise fails to comply with the provisions of this Section, shall upon conviction be fined the sum of not less than ten ($10.00) dollars, nor more than fifty ($50.00) dollars for each separate offense.

SECTION 20: The Board of Pharmacy shall make from time to time uniform rules and regulations, which are to govern it and its officers, and the Drug Commissioner and all employees in the enforcement of this Act. It shall prescribe, publish and furnish all application forms for license or registration, which are required under this Act.

SECTION 21: It shall be unlawful for any person who is not a licensed Pharmacist, licensed Assistant Pharmacist, licensed Medical, Dental or Veterinary Dispenser, or Drug Dealer, or who is not under the direct and immediate supervision of either of such licentiates operating within their lawful spheres, to compound, manufacture, sell or distribute at retail, or advertise to do so, any potent drugs or poison as hereinafter defined, or any other chemical, drug, or medicine, intended for internal or external use, excepting only that this provision shall not apply to the personal administration of drugs and medicines by physicians, dentists, and veterinarians, in keeping with Section 6 of this Act. It shall be unlawful for Medical, Dental or Veterinary Dispensers to compound, sell and distribute potent drugs or poisons, except for use by bona fide patients, who are under their medical treatment. It shall be unlawful for any Drug Dealer to compound or manufacture potent drugs, poisons or preparations containing the same, and it shall be unlawful for such Drug Dealer to sell or distribute potent drugs and poisons, except in original packages as prepared by and under the supervision of a licensed Pharmacist of this or some other state, territory or the District of Columbia, properly labeled to meet all requirements of the law, and bearing the name of the original distributor or manufacturer. Any person violating the provisions of this Section shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not less than ten ($10.00) dollars, nor more than five hundred ($500.00) dollars, or sentenced to imprisonment for not more than one (1) year, either, or both, in the discretion of the court.

SECTION 22: The term "Poison" shall mean to include all articles enumerated and defined in Schedule "A" and Schedule "B" hereinafter set out. The term "Potent Drug" shall mean all drugs and chemicals and their compounds and preparation which are not in Schedules "A" and "B," specifically, or by general inclusion defined as poison, but of which the adult medicinal dose is stated in standard works of medicine, materia medica, or toxicology, to be less than one fluidounce if liquid, and one avoirdupois ounce if solid.

SCHEDULE "A" POISON.

Arsenic and the compounds and chemical derivatives of arsenic, corrosive sublimate and other poisonous compounds and derivatives of mercury, phosphorus and its poisonous compounds and derivatives, tartar emetic or other poisonous salts or compounds of antimony, hydrocyanic acid, prussic acid, potassium cyanide, other cyanides and prussiates or other poisonous compounds and derivatives of cyanogen, oil of bitter almonds containing hydrocyanic acid, opium and its preparations and derivatives, aconite and its preparations, belladonna and its preparations, calabar bean and its preparations, scopola and its preparations, strophanthus and its preparations; the following organic

principles: aconitine, apomorphine, atropine, brucine, cantharidin, cocaine, codeine, coniine, digitalin, emetine, eucaine, gelsemine, homatrophine, hyoscine, hyoscyamine, morphine, diacetyl-morphine or heroin, ethyl-morphine or dionin, physostigmine or eserine, scopolamine, strophanthin, strychnine, veratrine or any of their chemical compounds, salts, or derivatives, or any other drug, chemical substance, or preparation which according to standard works on medicine, materia medica, or toxicology, is liable to be destructive to adult human life in doses of five grains or less.

SCHEDULE "B" POISON.

Cannabis, cantharides, Chinese blistering beetle, cocculus indicus, colchicum, cotton root bark, digitalis, ergot, gelsemium, hellebore, henbane, ignatia amara, phytolacca, nux vomica, veratrum, stramonium, savin, chloroform, ether, wood or methyl alcohol, white precipitate, red precipitate, silver nitrate, copper salts, salts of barium, lead salts, oxalic acid, mineral acids, arsenical solutions, iodine, tincture of iodine, carbolic acid, creosote, croton oil, oils of pennyroyal, rue, savin or tansy, or any other drug, chemical, substance or preparation which according to standard works on medicine, materia medica, or toxicology, while not considered as toxic in doses of five grains or less, is nevertheless liable to be destructive of adult human life in doses of sixty grains or less.

It is hereby provided that compounds and preparations containing poisons as defined in Schedules "A" and "B" in quantities of less than one adult medicinal dose to one-half fluidounce, if liquid, or one-half avoirdupois ounce, if solid, according to standard books on medicine, materia medica, or toxicology, shall not be regarded to be poisons and also that the provisions of this Act governing the sale and distribution of poisons unless otherwise provided by law, shall not apply to the sale or distribution of preparations or remedies which do not contain more than two grains of opium or more than one-fourth grain of morphine, or more than one-eighth grain of heroin, or more than one grain of codeine, or any salt or derivative of any of them in one fluidounce, or if solid or semi-solid preparations, in one avoirdupois ounce; or to plasters, liniments, ointments, or other preparations which are prepared for external use only, and when sold or distributed for use as medicines.

SECTION 23: Whoever knowingly sells or delivers to any person otherwise than in the manner prescribed by law, any poison as defined in this Act, or sells or delivers in the manner otherwise prescribed by law any poison as defined in this Act to a minor under sixteen (16) years of age, but without the written order of an adult, shall be fined not less than ten ($10.00) dollars, and not more than fifty ($50.00) dollars for each offense.

SECTION 24: Whoever sells or delivers to any person a poison as defined in this Act, without having first learned by due inquiry that such person is aware of the poisonous character thereof, and that it is desired for a lawful purpose or without plainly labeling the word "Poison" and the names of two or more antidotes therefor upon the box or package containing it, or, if included in the list of Schedule "A" Poisons, delivers such poison without recording in a book kept for that purpose the intended use thereof, the date of its delivery, and the name and address of the purchaser, and the name of the dispenser, or fails to preserve said book for five (5) years and submit it at all times for inspection to proper officers of the law, shall be fined not less than ten ($10.00) dollars nor more than fifty ($50.00) dollars for each offense. Provided, that when poisons are dispensed in keeping with a written record made by a licensed physician, dentist or veterinarian and such written record is filed and retained by a pharmacist, physician, dentist or veterinarian for at least one (1) year, the requirements herein shall be satisfied when the container of the poisons so dispensed bears a number or mark corresponding with a number or mark on the written record, so that it may be readily identified, unless the prescribing physician, dentist or veterinarian directs that the label shall bear the word "poison."

SECTION 25: The violation of any provision of this Act for which penalties are not specifically prescribed shall be subject to a fine of not more than $———dollars for each separate offense.

SECTION 26: All Acts or Sections heretofore enacted and now in force in this state, which are in conflict with this Act or any of its Sections are hereby repealed, provided that nothing herein contained shall be construed to amend or repeal any Acts or Sections which govern the manufacture, sale or distribution of narcotics.

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 15.

(Abstract.)

WASHINGTON, D. C., June 16, 1922.

78. Applicants 278–307 elected to active membership.

79. Request that an additional $10 be appropriated for the Scientific Section. Under date of May 29, 1922, Chairman Heber W. Youngken of the Scientific Section writes as follows:

"I have just heard from Secretary Viehoever of the Scientific Section of the A. Ph. A. He has sent me bills for stationery, postage and mimeographing for our section slightly exceeding $25 and states he will require $10 more to cover the remaining expenses to be incurred before the meetings in August.

"I therefore move that $10 additional be appropriated for carrying on the work of the Scientific Section during the present year."

This motion is seconded by A. G. DuMez, and a vote is being called for at this time. In the event of any adverse discussion, the vote will be considered tentative.

80. Letter of appreciation of the Council's action in presenting a set of Proceedings and Year Books to the Pharmaceutical Institute at Prague. Under date of June 5, 1922, Mr. Zdenek F. Klan writes as follows:

"*The Council of the American Pharmaceutical Association:*

"I am in receipt of a communication from Doctor Edward Kremers informing me of the gift of the Council to the Pharmaceutical Institution in Prague, Czechoslovakia. The pharmaceutical folks of our country will consider it a privilege to have the opportunity of using the Proceedings and Year Book of the American Pharmaceutical Association.

"I trust that I will be some day in Czechoslovakia of a service to the Council or to any member of the American Pharmaceutical Association and that I will have the favor of coöperation."

81. Election of active members. No. 308, Carrie Ritter, Clifton St., Springfield, Ohio; No. 309, Raoul Rene Cline, 1202 Avenue C, Galveston, Texas; No. 310, Abe Malakoff, 2409 Broadway North, Seattle, Wash.; No. 311, Walter Robert Zimmerman, 1517 Market St., Youngstown, Ohio; No. 312, Emil B. Barnes, 2641 Glenmawr Ave., Columbus, Ohio; No. 313, Eldie Scovel Weyer, 2322 Milwaukee Ave. E., Detroit, Mich.; No. 314, Frank Martin Hladky, 14701 Kinsman Rd., Cleveland, Ohio; No. 315, Frank Harry Weis, 1201 Parkwood Drive, Cleveland, Ohio; No. 316, A. Allison James, 723 W. End Boulevard, Winston-Salem, N. C.; No. 317, James Dickson Nutt, 820 Market St., Wilmington, N. C.; No. 318, Mark P. Souiller, Washington Arcade, c/o Gorenfle Pharmacy, Detroit, Mich.; No. 319, Walter E. Mayer, Washington Arcade, c/o Gorenfle Pharmacy, Detroit, Mich.; No. 320, Otto C. Laabs, 1929 Vliet St., Milwaukee, Wis.; No. 321, Charles William Schrag, Jr., 59 S. Forest Ave., Youngstown, O.; No. 322, Ralph Pollock White, 402 W. Federal St., Youngstown, Ohio; No. 323, William Frederick Walter, 1101 E. 74th St., Cleveland, Ohio; No. 324, Charles McDonald Andrews, Hillsboro, N. C.; No. 325, Claude E. Banicklow, 1315 Main St., Great Bend, Kans.; No. 326, David Harvey Kurtz, 6 N. Main St., Fort Scott, Kans.; No. 327, Peter H. Klinkanberg, 304 Main St., Ottawa, Kans.; No. 328, Roy Raymond Shoaf, 1719 W. 10th Ave., Topeka, Kans.; No. 329, Walter J. Bangs, Madison, Kans.; No. 330, Anton J. Laeri, 835 Fifth Ave., Youngstown, Ohio; No. 331, Leeroy Patton, New Lebanon, Ohio; No. 332, John Albert Davis, 73 Vesper St., Akron, Ohio; No. 333, Joseph Rudolph Kopecny, 7901 Superior Ave., Cleveland, Ohio; No. 334, Irving P. Gammon, Jr., 106 Marion St., Brookline, Mass.; No. 335, E. E. Stigall, 928–32 Central St., Kansas City, Mo.; No. 336, Joseph Triner, 1333–45 S. Ashland Ave., Chicago, Ill.; No. 337, Frank E. Gardner, 3123 Bloomingdale Rd., Chicago, Ill.; No. 338, Olaf Joseph Olsen, 239 Greenwood Ave., Gloucester, N. J.; No. 339, Abraham Klafter, 598 Dumont Ave., Brooklyn, N. Y.; No. 340, George Dudley Foster, 173 Maplewood Ave., Maplewood, N. J.; No. 341, L. Norman Fletcher, 1421 Ridgewood Ave., Lakewood, Ohio; No. 342, LeRoy E. Stobbs, 15317 Myrtle Ave., Harvey, Ill.; No. 343, Ernest Kenworthy Hoge, 46 N. 4th St., Martins Ferry, Ohio; No. 344, Israel A. Epstein, 441 Broadway, Bayonne, N. J.; No. 345, James E. Haines, 2700 W. Grand Blvd., Detroit, Mich.; No. 346, Lloyd Dewey Lawson, 3311 E. Jefferson Ave., Detroit, Mich.; No. 347, August H. Burkemper, 3975 St. Clair Ave., Detroit, Mich.; No. 348, Edward Veres, 2924 E. 79th St., Cleveland, Ohio; No. 349, Henry Isidor Rosenberg, 314 S. Third St., Brooklyn, N. Y.; No. 350, Edward Abraham

Schwartz, 122 E. 116th St., New York City; No. 351, Jules Doran McCartney, 2346—33rd Ave. So., Seattle, Wash.; No. 352, Shiro Nakamura, 315 East First St., Los Angeles, Calif.; No. 353, James Elliott Proctor, 124 E. Liberty, Wooster, Ohio; No. 354, Charles Thomas Paysinger, Newberry, S. C.; No. 355, Lewis Ellsworth Jarrett, 228 Harrison St., Richmond, Va.; No. 356, Frank Adolph Scheuber, 208 S. 5th St., Livingston, Mont.; No. 357, A. W. Saul, c/o Saul's Pharmacy, Norfolk, Va. A. G. DuMez, *Secretary.*

A. PH. A. COUNCIL LETTER NO. 16.
(Abstract.)

WASHINGTON, D. C., June 30, 1922.

To the Members of the Council:

82. Request that $10 be appropriated for Scientific Section.—Carried.

83. Applicants Nos. 308–357 elected to active membership.

84. New York Branch elects new Council Representative. Under date of June 28, 1922, Secretary Hugo H. Schaefer of the New York Branch writes as follows:

"This is to notify you that Dr. Jacob Diner of 344 West 85th Street, New York City, has been elected to represent our Branch in the Council in place of Dr. Hostmann who has recently resigned."

85. Program for the Cleveland meeting. The Committee on Program presents the following tentative program for the seventieth annual convention to be held in Cleveland, August 14 to 18:

TENTATIVE DRAFT OF PROGRAM.

Monday August 14.

9:00 A.M. First meeting of the Council.
9:00 A.M. National Association Boards of Pharmacy.
2:00 P.M. National Association Boards of Pharmacy.
2:00 P.M. American Conference of Pharmaceutical Faculties.
7:00 P.M. Second meeting of the Council.
8:00 P.M. National Association Boards of Pharmacy.
8:00 P.M. American Conference of Pharmaceutical Faculties.

Tuesday, August 15.

8:30 A.M. National Association Boards of Pharmacy.
8:30 A.M. American Conference of Pharmaceutical Faculties.
10:30 A.M. First General Session—Joint Session of the A. Ph. A. with House of Delegates. The Committee on Nominations will meet immediately after the adjournment of the General Session.
2:00 P.M. First Session of Scientific Section.
2:00 P.M. First Session of Section on Education and Legislation.
3:30 P.M. Second Session of House of Delegates.
8:00 P.M. Third Meeting of the Council.
9:00 P.M. President's Reception.

Wednesday August 16.

9:00 A.M. Joint Session of the National Association of Boards of Pharmacy, the American Conference of Pharmaceutical Faculties and the Section on Education and Legislation.
10:00 A.M. First Session, Women's Section.
2:00 P.M. Boat Ride.
7:00 P.M. First Session of Section on Practical Pharmacy and Dispensing.
7:00 P.M. First Session of Section on Commercial Interests.
8:00 P.M. Fourth Meeting of the Council.
9:00 P.M. First Session of Section on Historical Pharmacy.
1. Lecture by Dr. H. M. Whelpley.

Thursday, August 17.

9:00 A.M. Second General Session.
10:00 A.M. Second Session, Women's Section.
1:30 P.M. Second Session of the Section on Practical Pharmacy and Dispensing.
1:30 P.M. Second Session of the Section on Historical Pharmacy.
4:00 P.M. Auto Ride.
6:00 P.M. Yacht Club Dinner Dance.

Friday, August 18.

9:00 A.M. Second Session of the Scientific Section.
9:00 A.M. Second Session of Section on Commercial Interests.
10:30 A.M. Third Session of House of Delegates.
12:00 M. Alumni Luncheons.
2:00 P.M. Second Session of the Section on Education and Legislation.
4:00 P.M. Council Reorganization Meeting.
8:00 P.M. Final General Session.

The Hotel Statler has been selected as Headquarters for the Convention.

Inasmuch as time is precious if we expect to place the program in the hands of the drug journals so that it can be printed in the issues for next month, a vote is being called.

A. G. DuMez, *Secretary.*

The names of members elected and reported in letter No. 16 will be printed in the August issue—numbers 358–390. Program has been adopted.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

Committee on Publication: A. G. DUMEZ, *Chairman;* J. H. BEAL, IVOR GRIFFITH, R. A. LYMAN, H. B. MASON, and the Editor-in-Chief of the JOURNAL, General Secretary, Treasurer and Reporter on the Progress of Pharmacy, *ex-officio.*

Collaborators: S. L. HILTON, President, A. Ph. A.; C. A. DYE, President, A. C. P. F.; L. L. WALTON, President, N. A. B. P.; E. FULLERTON COOK, Chairman, U. S. P. Revision Committee; CHARLES H. LAWALL, Chairman, Council A. Ph. A. The Chairmen of the Sections, A. Ph. A.: HEBER W. YOUNGKEN, IVOR GRIFFITH, W. H. ZIEGLER, C. W. HOLTON, CURT P. WIMMER; E. F. KELLY and JEANNOT HOSTMANN of the House of Delegates; A. G. DUMEZ, Secretary of the Council, WILLIAM B. DAY, General Secretary, and H. V. ARNY, Reporter on the Progress of Pharmacy.

MORE EFFICIENT HOSPITAL PHARMACISTS.

An editorial under above caption is reprinted from *The Modern Hospital* for June. The reference made to the announcement on page 523 occupies even more space than the editorial and is an announcement of the Section on Practical Pharmacy and Dispensing for the Cleveland Meeting and a call to hospital pharmacists.

The Modern Hospital is a most excellent publication devoted to the building equipment and administration of hospitals, sanatoriums and allied institutions, and to their medical, surgical and nursing services. There are about 100 text pages and its many advertising pages indicate the value placed on this publication by the advertisers. The editorial follows:

"'The attention of hospital pharmacists is called to the announcement of the American Pharmaceutical Association which appears on page 523 of this issue. As the announcement stipulates, this association is anxious to include in its membership pharmacists who are connected with the hospitals of this country in order to give what is at present an unorganized group an opportunity to meet from year to year, discuss their common problems and through the Year Book and the association's Journal keep abreast of the advances in scientific and professional pharmacy.

"At the annual convention of the American Pharmaceutical Association last September the hospital pharmacists as a group had a share in the problem of the Section on Practical Pharmacy and Dispensing and this will also be true at their Cleveland meeting which is to be held next August.

"Already 100 hospital pharmacists are members of the association. With a little effort this number might easily be doubled during the next year. Will the superintendents of hospitals whose pharmacists are not members of the association bring the notice on page 523* to their attention and urge them to join? They will be the better pharmacists for it and perform their tasks more efficiently."

CARBON TETRACHLORIDE SUCCESSFUL IN TREATMENT OF HOOKWORM.

The discovery of the efficacy of carbon tetrachloride in removing hookworms was made by Dr. Maurice C. Hall of the United States Department of Agriculture. His results immediately stimulated medical men in many countries to start investigations, and favorable reports are now being received by the department.

The tests made on human beings in various countries, including 12,000 natives in Fiji, bear out those made by Dr. Hall. He found that a dose of 0.3 of a cubic centimeter to a kilogram of live weight was effective, but in one case a dog was given nearly a half pint without evidence of injury to the animal. The United States Public Health Service reports that relatively heavy doses given to monkeys produced no symptoms of poisoning and no noticeable change in any of the organs.

No effects other than slight dizziness and a sensation of weight in the stomach were noticed in the case of adults receiving less than 10 cubic centimeters of the drug. The prisoner receiving 10 cubic centimeters experienced some nausea and drowsiness.

SHELLEY'S CENTENARY.

The Centenary of the poet Shelley is referred to in chemical and pharmaceutical publications. Shelley was born July 18, 1822, and evidently he was interested in chemistry; his biographer says that at Oxford, "Shelley's rooms were chaos piled upon chaos, a medley of manuscripts, chemical apparatus and crucibles heaped upon precious books in the precipitancy of the moment."

* *The Modern Hospital.*

PERSONAL AND NEWS ITEMS.

The Hanbury Medalist for 1922 is Professor Emile Perrot of the Faculty of Pharmacy of the University of Paris, where he is professor of Vegetable Materia Medica. He is also associated with the High School of Pharmacy, Paris.

The adjudicators were Dr. A. Smith Woodward, President of the Linnean Society; Sir James Walker, President of the Chemical Society; Mr. E. T. Nethercoat, President of the Pharmaceutical Society of Great Britain; Professor Greenish as President of the British Pharmaceutical Conference; and Mr. Edmund White, pharmaceutical chemist, nominated by the Presidents of the Pharmaceutical Society of Great Britain and of the British Pharmaceutical Conference.

H. B. McWilliams has resigned his position as Assistant Professor of Pharmacy in the Oregon Agricultural College and will move to Los Angeles, California, where he has acquired an interest in the Inter-Americas Commercial Company.

C. R. DeLong, chief chemist on the staff of the United States Tariff Commission, has been selected to head the proposed new chemical division of the Bureau of Foreign and Domestic Commerce, Department of Commerce. He has accepted the designation and will take hold of the duties of his new position August 1.

Mr. DeLong was born and educated in the state of Ohio. He was graduated from the Ohio State University, Columbus, in 1914, with the degree of Bachelor of Science in Chemical Engineering.

M. H. Hickox of the traveling force of the Mallinckrodt Chemical Works, St. Louis, has returned to business after an absence of two months. He has fully recovered from an affection of the eyes which had confined him to his home.

Dr. Jacob Diner has been elected President of New York State Pharmaceutical Association.

A. Homer Smith, who during the war represented the drug trade on the War Service Board at Washington, is the new secretary of the American Drug Manufacturers' Association.

Dr. H. H. Rusby, Prof. Julius A. Koch, Ambrose Hunsberger and Samuel C. Henry were honored with the degree of Master of Pharmacy by the Philadelphia College of Pharmacy and Science. Prof. Julius A. Koch and daughters are at present in Europe.

Prof. J. U. Lloyd is spending part of the summer with his daughter, in California.

Prof. and Mrs. Hugo H. Schaefer have cabled the arrival of George Theodore to the grandfather, who is at present in Europe. The father is secretary of New York Branch, A. Ph. A.

Prof. E. F. Kelly was one of the speakers at North Carolina Pharmaceutical Association.

Two of the **J. Leon Lascoff** prizes at College of Pharmacy of the City of New York—memberships in the American Pharmaceutical Association—were awarded to H. I. Rosenberg and Abraham Schwartz.

Ohio druggists, members of the Medico-Pharmaco Club, Cleveland, made a tour of the East, visiting points of interest. They stopped in Philadelphia, and visited Baltimore and Washington.

James F. Ballard, St. Louis, widely known throughout drug circles for various activities in the calling, has presented New York Metropolitan Museum of Art with 126 antique rugs. These rugs which included fine Persian, Spanish, Damascene, Chinese, Asia Minor and other specimens, date from the end of the fifteenth century through the eighteenth century. The group from Asia Minor is declared to have no equal in any other collection. Some have been found in the bazaars of Constantinople, others come from well-known European collections. All were gathered personally by Mr. Ballard, who traveled 250,000 miles in the course of his collecting.

Mr. Ballard entered the drug business as a boy of fourteen years, in Almont, Mich.; since 1883 he has been in business on his own account in St. Louis, and is now seventy-one years of age.

The John B. Bond Drug Co., Little Rock, Ark., has been succeeded by the Hessig-Ellis Drug Co., of Arkansas. The new company is affiliated with the Hessig-Ellis Drug Co., Memphis, Tenn., but is a distinct corporation, although R. R. Ellis is president of both.

The controlling interest in the **Heyden Chemical Co of America, Inc.,** Garfield, N. J., has been purchased by Bernard R. Armour, president of American Aniline Products, Inc.

Evidently ice creams were made in 1822. *Poulson's Advertiser* of July 4, 1822, under the caption of "Hints for the Fourth of July" says: "Avoid drinking cold water when heated and never without washing your wrists, face and hands. Avoid ice punch, *ice creams,* or anything excessively cold when you are heated.

OBITUARY.

ERNEST SOLVAY.

Ernest Solvay, originator of the Solvay process, died at Brussels, Belgium, on May 26th, at the age of 84 years. On his seventy-sixth birthday M. Solvay was appointed by King Albert a Grand Officer of the Order of Leopold, and he also received the Lavoisier Medal of the Institute of France and the Grand Medal of the University of Paris. He, in turn, presented $100,000 each to the Universities of Paris and Nancy and divided $1,000,000 among Belgian educational and charitable institutions and the employees of his firm, the Solvay Society of Brussels.

HENRY GEORGE DUERFELDT.

Henry George Duerfeldt, prominent Spokane business man and owner of the Columbia Pharmacy, died of diabetes June 24, after an illness of 18 months.

Mr. Duerfeldt was born on a farm near Williamsville, Neb., July 16, 1871. At the age of 13, tiring of farm life, he went to work for his uncle, Henry M. Perchen, who owned a drug store in Helena, and with him began his career as a pharmacist. He was married in Helena, April 21, 1897, to Miss Edna Matthews and later accepted a position with the Montana Drug Company in Butte.

In 1909 he came to Spokane to become manager of Murgittroyd's which position he held until 1914, when he bought the Columbia Pharmacy, which he developed into a large business.

Mr. Duerfeldt served two years as president of Washington Pharmaceutical Association and was active in the Spokane Ad Club, the Chamber of Commerce and other civic organizations.

Mr. Duerfeldt was a trustee in the Grace Baptist Church, and a member of the Elks and Masonic lodges, and served as a member of the board of druggist examiners before the abolishment of the board by the new state code.

Mr. Duerfeldt in a quiet way did much for many who had met with misfortune and because of his kindness, his winning personality and his ceaseless energy, he was highly esteemed.

He is survived by his widow, one daughter, Kathryn, and two sons, Tracy and Theron. Tracy graduated in pharmacy May 1922, from Washington State College and had planned to study medicine. He was awarded the Fairchild Scholarship last year.

JOHN H. SNIVELY.

John H. Snively, of Brooklyn, consulting editor of *The Druggists' Circular* since 1904, and for eighteen years prior to that time its managing editor, died June 4 in his eighty-second year. Besides being an editor he was the author of tables for qualitative chemical analysis and of a treatise on the manufacture of perfumes, both of which, especially the latter, had a considerable vogue in their time. He was also, in the seventies, professor of analytical chemistry in the Tennessee College of Pharmacy, and its registrar. At that time he was engaged in the retail drug business at Nashville.

Mr. Snively was born at Shepherdstown, Va. (West Virginia since 1872), December 16, 1840, and engaged in the drug business at Hagerstown, across the Potomac, on the Maryland side, before going to Nashville.

WILLIAM LITTLE CURRIE.

W. L. Currie, chemist and druggist at Glasgow, president of the British Pharmaceutical Society, 1918–1920, died May 25, aged 65. He was a strenuous and consistent lifelong advocate of rational pharmaceutical education, and a loyal organization man. We quote from an editorial of the *Pharmaceutical Journal and Pharmacist*, June 3: "He also did monumental work for the organization of pharmacy, first as a member, then as President for the record period of thirteen years, of the Glasgow and West of Scotland Pharmaceutical Association, as Chairman of the Federation of Local Associations, which did more than point the way to more recent developments of organization, as a member and Vice-Chairman of the Executive of the North British Branch, and more notably still during his nineteen years' membership of the Council—three years as Vice-President, and two years as President. His constant endeavor throughout was to make himself worthy of the profession to which he was wedded, and to make it worthy and of good repute both within its own borders and in the knowledge and esteem of the community and the nation."

The president of the Glasgow Pharmacy Club, H. P. Arthur, said of him, "he did with all his might whatsoever his hand found to do. This trait was manifested more particularly during his term as President of the Pharmaceutical Society—surely the most troublesome two years any president ever experienced. The calls upon him were incessant, but duty had to be done even though the strain should prove too much for his not too robust physique; and the

price of that service has now been paid. In Glasgow, where his public service began, no man was held in higher esteem by his *confrères*, and though in later years some there were who differed from him on various questions, he retained to the last the affection and respect of them all."

SOCIETIES AND COLLEGES.

CLEVELAND MEETING OF AMERICAN PHARMACEUTICAL ASSOCIATION.

It is time to prepare for the Cleveland Meeting of the American Pharmaceutical Association—to convene Monday, August 14, 1922.

See your R. R. agent promptly relative to rates on Certificate Plan. The tentative program of the Association will be found under "Council Business" of this issue. The program of the American Conference of Pharmaceutical Faculties is printed in the pages of the department assigned them.

If you have a paper or report to present, please send it to a Section officer, Association, or Committee. The Association roster is printed in the May JOURNAL, pp. 380–385, and calendar of state meetings on page 386.

The Statler Hotel has been selected as headquarters hotel; rates at other hotels can be obtained by writing to the Local Committee; please see page 328, May JOURNAL, and page X of June issue.

THE SECTIONS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

1. Scientific Section.

TENTATIVE PROGRAM.

Chairman's Address. Committee Reports. Business Section.

Symposium: Revision of the Pharmacopoeia and National Formulary.

Address by Chairman of U. S. Pharmacopoeia Revision Committee. E. Fullerton Cook.

Address by Chairman of National Formulary Revision Committee. Wilbur L. Scoville.

2. Discussion led by Chairmen of Sub-Committees.

PAPERS.

"Color Standardization in the U. S. Pharmacopoeia." E. N. Gathercoal.

3. Physics.

"Physics in Pharmacy." John Uri Lloyd.

"Electrometric Methods of Drug Assay." W. J. McGill.

4. Pharmaceutical Botany and Pharmacognosy.

"The Status of Drug Plant Growing in the United States in 1921." W. W. Stockberger.

"A Garden of Herbs." Caswell A. Mayo.

"Kino, Gambir and Catechu." E. N. Gathercoal and R. E. Terry.

"Uniformity of Powdered Drugs." E. L. Newcomb.

"The Occurrence of Forms of Calcium Oxalate in Official Crude Drugs." E. T. Wherry and Geo. L. Keenan.

"Organic Constitutions of Vegetable Drugs." E. L. Newcomb.

"A Review of Crude Drug Imports for the Past Year at the Port of New York." E. L. Schwarz.

"Work of the Pharmacognosy Laboratory, Bureau of Chemistry." A. Viehoever.

5. Pharmaceutical Chemistry.

Manufacturing:

"Fluid Extract of Ergot." J. P. Snyder.

"Influence of Hydrochloric Acid in Cinchona Preparations." Wilbur L. Scoville.

"Improved Process for the Manufacture on a Large Scale of F. E. Glycyrrhiza U. S. P." Geo. W. Regg.

"Hot Extraction." Wilbur L. Scoville.

Preparations.

"Solution of Chlorinated Soda." E. Frank Kelly and John C. Krantz, Jr.

"Solubility of Chloroform in Simple Syrup and Other Syrups." Geo. W. Regg.

"Petroleum Base for Ointment Zinc Oxide, U. S. P." Geo. W. Regg.

Assay Methods.

"A Method for Assaying Ointment of Stramonium, U. S. P." Richard Bliss, Jr., and M. F. Brown.

"The Quantitative Determination of Sparteine in Tablets." P. W. Jewel.

6. Biological Chemistry.

"Pepsin—Methods Used for Its Quantative Estimation—Its Permanence and Effectiveness in Some of Its Preparations." E. J. Traut and H. W. Vahlteich.

"Stability of Elixir Lactated Pepsin." Geo. W. Regg.

7. Pharmacology.

"Tad-poles and Toxicity." L. E. Sayre.

"Pharmacological Aspects of the Dispensing of Arsenic." E. W. Schwartze.

8. Chemistry of Foods, Beverages, etc.

"Analyses of One Hundred Present-Day Alcoholic Beverages." Henry Kraemer.

9. Review of Literature on Pharmaceutical Chemistry, by W. O. Emery, and likely by

others on literature in their respective fields of endeavor.

The names of all Section officers will be found in May JOURNAL, pp. 380–385. All Sections want more papers—please note and respond.

ELEVENTH ANNUAL MEETING OF AMERICAN DRUG MANUFACTURERS' ASSOCIATION.

The eleventh annual meeting of the American Drug Manufacturers' Association was held at Hotel Biltmore, New York, June 5–8. The meeting was marked by a spirit of service, manifested in offering the results of the Association's scientific work to pharmacy, and in the proffered assistance of the organization in constructing tariff legislation.

William A. Sailer was reëlected President of the Association. The other officers are: Vice-Presidents, Charles G. Merrell, Cincinnati (reëlected); Dr. S. R. Light, Kalamazoo, and Oscar W. Smith, Detroit; Treasurer, Franklin Black, New York. The Executive Committee consists of the officers and S. B. Penick, New York, chairman; H. H. White, Philadelphia, and Dr. Alfred S. Burdick, Chicago. Secretary, A. Homer Smith, Indianapolis.

The address of President William A. Sailer was comprehensive, embodying a résumé of business and market conditions, taxation, legislation and federal relations. Relative to legislation, he had this to say:

"Too frequently laws and regulations designed to accomplish a definite purpose fail utterly in that direction and work disastrously for some legitimate interest of which the author was entirely ignorant or had not even considered. We have had too much law and regulation in business, until many branches of American industry are so badly hampered by red tape and senseless restrictions that there remains little incentive to risk the necessary capital or expend the energy required to insure successful progress."

He advocated that the scope of the membership be enlarged to be representative of all manufacturing interests of the drug industries.

Owing to the absence of Charles M. Woodruff, Chairman of the Committee on Legislation, the report of latter committee was read by J. Fred Windolph; it contains many points of interest to the drug trade, and the recommendations of the Committee will be printed in next issue of the JOURNAL.

A. PH. A. MEMBERSHIP PRIZES.

School of Pharmacy, University of Illinois, awarded A. Ph. A. Membership Prizes to: Darwin R. Turner, Chemistry; Clarence P. Gleich, Pharmacy; and Anna Bee Haller, Materia Medica.

University of Pittsburgh College of Pharmacy awarded the following A. Ph. A. Membership Prizes to: Theresa Freud, Chemistry; Clarence Kennelty, Pharmaceutical Products; Sister Mary Berchmans Shields, Pharmacognosy; Louis Gicquelais, Materia Medica; Francis Bradley, Applied Pharmacy.

Three of the prizes of Iowa University College of Pharmacy were recommendations to membership in the American Pharmaceutical Association. The one offered by Mr. Gus Scherling of Sioux City for general excellence in organic chemistry, laboratory work included, was awarded to C. Albert Veach of Centerville. Julius L. Bredahl of Fontanelle was the winner of two, that offered by Dean W. J. Teeters for the highest rating in recognition of vegetable drugs decided by competitive examination and that offered by Prof. Zada M. Cooper to the senior ranking highest in practical pharmacy.

The subscription to the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION offered by Prof. R. A. Kuever to the junior student ranking highest in practical pharmacy was awarded to Joseph J. Pfiffner of Dubuque.

Donors of other memberships will be given in succeeding issues of the JOURNAL.

SCHOOL OF PHARMACY OF THE MEDICAL COLLEGE OF VIRGINIA.

R. L. Howard, Associate Professor of Chemistry in the School of Pharmacy, has been awarded a research fellowship in Pharmacology at Western Reserve University for session 1922–23.

The Pharmacy faculty will be enlarged and additional courses offered next session. New instructors are as follows: G. F. Reddish, Ph.D. (Yale), Department of Bacteriology; Paul A. Warren, Ph.D. (University of Michigan), Department of Botany; William Clift, B.S. (V. P. I.), Department of Chemistry.

EDITOR'S NOTE.—On account of the inclusion of the Model Modern Pharmacy Law, which should reach those most interested before the Cleveland Meeting, some of the divisions of this section of the JOURNAL have been omitted and others abridged.